Development and evaluation of a telephone-based intervention for cannabis use disorder

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A thesis submitted in accordance with the requirements for admission to the degree of Doctor of Philosophy

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June, 2012
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Thank you.
ABSTRACT

A minority of cannabis users will experience problematic use or be diagnosed with a cannabis use disorder. As cannabis is the most commonly used illicit drug, this minority represents a significant number of individuals. Notably, however, few will attend treatment to reduce their use. Heavy, regular cannabis users commonly report a lack of motivation to enter face-to-face treatments and a wish to avoid the stigma associated with accessing illicit drug treatment. A telephone-based intervention may be ideal as ambivalent treatment seekers can maintain anonymity to a greater extent compared to face-to-face treatment, would not be required to travel, and could receive inexpensive information or counselling as needed. Telephone-based substance use intervention research is almost exclusive to tobacco and alcohol use. The present thesis extends this research by developing and evaluating a telephone-based cannabis treatment (the Cannabis Assistance HelpLine, or CAHL intervention) as an extension to the usual service of the Cannabis Information and Helpline (CIH) in Australia. First, the demographic and substance use profile of callers to the CIH was described. Second, an impact evaluation survey was conducted with 200 callers to the CIH, and patterns of utilisation and predictors of satisfaction were established. Third, based on the impact evaluation, the CAHL intervention was developed and CIH counsellors were trained to deliver the intervention. Finally, 160 individuals were randomly allocated to receive the CAHL intervention (n=79) or a delayed treatment control (n=81). Baseline and four- and 12-week follow-up interviews surveyed the participants’ cannabis use frequency and quantity, cannabis dependence severity and related problems, and aspects of physical and mental health. Intervention participants reported greater reductions in cannabis dependence severity (Cohen’s d=0.9) and cannabis-related problems (d=0.5) compared to the wait-list control at both follow-up assessments. Treatment outcomes
were comparable to face-to-face intervention trials, and reductions in cannabis use were partially driven by the intervention effect of increasing confidence to avoid cannabis use. The telephone delivery of cannabis treatment is a promising means to extend the reach of healthcare without compromising on outcome. Future work to improve telephone-based cannabis interventions is discussed.
# Table of Contents

ABSTRACT ........................................................................................................................................... v

CHAPTER ONE: INTRODUCTION........................................................................................................ 1

PATTERNS, PREVALENCE AND PREDICTORS OF CANNABIS USE............................................. 2

Patterns of cannabis use ................................................................................................................ 2

Prevalence of cannabis use .......................................................................................................... 4

Predictors of cannabis use .......................................................................................................... 5

INTERNATIONAL EPIDEMIOLOGY OF CANNABIS USE ......................................................... 6

PSYCHOPHARMACOLOGY OF CANNABIS USE ................................................................. 7

MOTIVATIONS FOR CANNABIS USE ..................................................................................... 8

HEALTH EFFECTS OF CANNABIS USE .................................................................................. 10

Adverse health effects relating to acute cannabis use ............................................................ 10

Adverse health effects relating to chronic cannabis use ...................................................... 15

Cannabis use and its effects on educational attainment ...................................................... 27

RESPONDING TO THE ADVERSE HEALTH EFFECTS OF CANNABIS USE.................. 28

Patterns and prevalence of cannabis treatment seeking ...................................................... 28

Barriers to seeking cannabis treatment .............................................................................. 30

An unmet need for cannabis treatment .............................................................................. 32

CHAPTER TWO: TREATMENTS FOR CANNABIS USE DISORDER........................................... 34

OVERVIEW ..................................................................................................................................... 34

COUNSELLING STYLES ........................................................................................................... 35
Delivering a cannabis use intervention via computer.................................................. 101

Delivering a cannabis use intervention by telephone .................................................. 105

WHERE TO FROM HERE? ........................................................................................ 107

Thesis overview .............................................................................................................. 107

CHAPTER THREE: TELECOMMUNICATIONS FOR SUBSTANCE USE CONCERNS

OVERVIEW ..................................................................................................................... 111

TELECOMMUNICATION TECHNOLOGIES IN HEALTHCARE ......................... 111

Telemedicine .................................................................................................................. 113

Telepsychiatry ................................................................................................................ 113

Interactive voice response technology ........................................................................ 114

Mobile phone and smartphone applications ................................................................ 116

Telephone counselling .................................................................................................. 119

TELEPHONE COUNSELLING FOR SUBSTANCE USE TREATMENT .......... 120

The benefits of telephone counselling in substance use treatment ......................... 122

The draw backs of telephone counselling as substance use treatment ...................... 124

Telephone counselling for tobacco cessation ............................................................ 126

Telephone counselling for substance use – a literature review ................................ 137

TELEPHONE COUNSELLING – WHAT HAVE WE LEARNED AND WHERE TO FROM HERE? .................................................................................................................. 157

CHAPTER FOUR: THE CANNABIS INFORMATION AND HELPLINE - PROCESS EVALUATION .............................................................................................................. 161
OVERVIEW ....................................................................................................................... 161

ON SELECTING A SUBSTANCE USE HELPLINE TO DELIVER A
TELEPHONE-BASED CANNABIS USE INTERVENTION ........................................... 161

The tobacco *Quitline* .................................................................................................. 162

The *Alcohol and Drug Information Service* ............................................................... 163

The *Cannabis Information and Helpline* ................................................................. 165

STUDY ONE – THE CIH PROCESS EVALUATION ....................................................... 168

Methods and procedure ............................................................................................ 168

Data Analysis Techniques ......................................................................................... 170

Results ......................................................................................................................... 171

Discussion .................................................................................................................. 186

CHAPTER FIVE: EVALUATING THE IMPACT OF THE CANNABIS
INFORMATION AND HELPLINE ............................................................................. 192

OVERVIEW ....................................................................................................................... 192

TREATMENT SATISFACTION IN HEALTH RESEARCH ........................................... 192

The utility of measuring satisfaction .......................................................................... 193

Some concerns regarding the measurement of satisfaction ..................................... 194

Predictors of satisfaction with mental health treatments .......................................... 194

Predictors of satisfaction with substance use treatments ......................................... 195

TELEPHONE SATISFACTION STUDIES ................................................................. 197

Literature regarding satisfaction for substance use telephone counselling ............ 198

CHAPTER AIMS ........................................................................................................... 199
METHODS .................................................................................................................. 200
Procedure .................................................................................................................. 200
Participants .............................................................................................................. 201
The Impact Evaluation Survey .................................................................................. 202
The *Cannabis Information and Helpline* dataset (CIH LIFE) .................................. 207
Data Analysis Techniques ....................................................................................... 208

RESULTS ................................................................................................................... 209
Aim one: Profile the callers to the CIH ................................................................. 209
Aim two: Describe the content and outcomes of calls to the CIH service .......... 213
Aim three: Describe the caller’s satisfaction with the CIH service ...................... 216
Aim four: identify predictors of call satisfaction .................................................... 220

DISCUSSION .............................................................................................................. 221
Future work .............................................................................................................. 226
Limitations ............................................................................................................... 226
Implications and conclusions ............................................................................... 227

CHAPTER SIX: THE CANNABIS ASSISTANCE HELPLINE DEVELOPMENT
AND EVALUATION METHODS .............................................................................. 229

OVERVIEW ................................................................................................................. 229
WHY DEVELOP A TELEPHONE-BASED CANNABIS INTERVENTION? .......... 229
EXISTING PROACTIVE TELEPHONE-BASED CANNABIS INTERVENTIONS
................................................................................................................................. 231

THE CANNABIS ASSISTANCE HELPLINE PROJECT ........................................... 232
Methods.................................................................................................................................................. 233

Intervention conditions .......................................................................................................................... 238

REGARDING THE DEVELOPMENT OF THE CAHL INTERVENTION ........ 240

Treatment seeker’s motivation and confidence to avoid use ......................................................... 242

Working alliance .................................................................................................................................. 242

Counselling style .................................................................................................................................. 243

Reduction technique ............................................................................................................................ 244

Number and length of sessions .......................................................................................................... 245

The timing from one session to the next .............................................................................................. 246

Self-help materials ............................................................................................................................... 247

Social support ....................................................................................................................................... 248

Treatment Fidelity ................................................................................................................................. 248

PROJECT CAHL - MATERIALS........................................................................................................ 249

The Consent Form and Screener Sheet .............................................................................................. 249

The Participant Contact Form ............................................................................................................ 249

The Treatment Manual ....................................................................................................................... 250

The Session Quick-guides .................................................................................................................. 250

The Quitting Cannabis Workbook ................................................................................................... 251

The Cannabis Use Self-Monitoring Diary ......................................................................................... 251

The Clinician Checklists ..................................................................................................................... 252

The Participant Feedback Report ........................................................................................................ 253
The Working Alliance Short Form ................................................................. 253

PROJECT CAHL - MEASURES ..................................................................... 254

The baseline assessment ........................................................................... 254

The follow-up assessments ....................................................................... 261

PROJECT CAHL - PROCEDURES ............................................................... 262

PROJECT CAHL - DATA ANALYSIS ........................................................... 263

CHAPTER SEVEN: PROJECT CAHL RESULTS AND DISCUSSION ........ 269

OVERVIEW ................................................................................................... 269

RESULTS ...................................................................................................... 270

Participant characteristics ........................................................................ 270

Use of external treatments and medication ................................................. 275

Aim one: Intervention delivery ................................................................. 276

Aim two: Group differences in treatment outcomes ................................... 287

Aim three: Clinical significance of cannabis use outcomes ....................... 291

Aim four: Predictors of change ................................................................. 292

Aim five: The effect of confidence to avoid cannabis on reductions in cannabis use 296

DISCUSSION .............................................................................................. 297

Treatment adherence ................................................................................... 299

Treatment outcomes and their clinical meaningfulness ........................... 301

Putting the clinical utility of the CAHL intervention into perspective .... 302

Benchmarking the reductions reported by CAHL intervention participants 303
Treatment outcomes and comparisons with a single session telephone-based cannabis intervention ................................................................. 304
The influence of common factors on treatment outcomes .............................................. 305
Mechanism of change - participant confidence to avoid cannabis use ...................... 308
Secondary treatment outcomes – other substance use outcomes .......................... 309
Secondary treatment outcomes – health related outcomes ................................. 310
Putting the secondary treatment outcomes into perspective – health related quality of life .............................................................................................................. 311
Putting the secondary treatment outcomes into perspective – psychological distress 312
Generalisability of findings .................................................................................. 313
The strengths of the Cannabis Assistance HelpLine intervention ......................... 317
Limitations of the Cannabis Assistance HelpLine intervention ............................. 319
Conclusions and future work ............................................................................ 321
CHAPTER EIGHT: OVERALL DISCUSSION ..................................................... 323
THESIS OVERVIEW ..................................................................................... 323
Research Question 1: How does the CIH operate? .................................................. 327
Research Question 2: Who calls the CIH and why do they call? ......................... 327
Research Question 3: Do the callers receive information, counselling and/or referrals? ........................................................................................................... 328
Research Question 4: Are the callers to the CIH satisfied with their call? ............ 329
Research Question 5: Are callers given any information, advice and or referral that they utilise? ......................................................................................... 329
Research Question 6: What aspects of the call, or the caller, predict satisfaction with the call?.................................................................................................................................................. 331

Research Question 7: Can a telephone-based treatment lead to a reduction in cannabis use and improvement in physical and mental health, and do these treatment gains remain while controlling for any additional external support?.......................... 332

Research Question 8: Is there any correlation between treatment gains and the treatment seeker’s demographic profile?.................................................................................................................. 336

LESSONS LEARNED AND FUTURE WORK.......................................................................................................................... 338

The applicability of telephone services for substance use related concerns .......... 339

Call duration or treatment length – does it matter?................................................................. 340

Improving on the Cannabis Assistance HelpLine ................................................................. 342

Strengths of the Cannabis Assistance HelpLine intervention............................................. 344

Limitations of the Cannabis Assistance HelpLine intervention................................. 346

CONCLUSIONS ................................................................................................................................................................. 348

REFERENCES........................................................................................................................................................................ 351
APPENDICES

APPENDIX A: THE CANNABIS INFORMATION AND HELPLINE CALL SHEET

APPENDIX B: THE IMPACT EVALUATION SURVEY

APPENDIX C: THE CANNABIS ASSISTANCE HELPLINE TREATMENT MANUAL

APPENDIX D: PROJECT CAHL PARTICIPANT SURVEY

APPENDIX E: PUBLICATIONS AND PRESENTATIONS ARISING FROM THE PRESENT THESIS
## LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Acceptance and commitment therapy</td>
</tr>
<tr>
<td>ADIS</td>
<td>Alcohol and Drug Information Service</td>
</tr>
<tr>
<td>CAHL</td>
<td>Cannabis Assistance HelpLine</td>
</tr>
<tr>
<td>CBD</td>
<td>Cannabidiol</td>
</tr>
<tr>
<td>CBT</td>
<td>Cognitive behavioural therapy</td>
</tr>
<tr>
<td>CEQ</td>
<td>Credibility/Expectancy Questionnaire</td>
</tr>
<tr>
<td>CIH</td>
<td>Cannabis Information and Helpline</td>
</tr>
<tr>
<td>CM</td>
<td>Contingency management</td>
</tr>
<tr>
<td>CPQ</td>
<td>Cannabis Problems Questionnaire</td>
</tr>
<tr>
<td>CSQ</td>
<td>Client Satisfaction Questionnaire</td>
</tr>
<tr>
<td>CUD</td>
<td>Cannabis use disorder (cannabis abuse or cannabis dependence)</td>
</tr>
<tr>
<td>CYT</td>
<td>Cannabis Youth Treatment study</td>
</tr>
<tr>
<td>DSM</td>
<td>Diagnostic and Statistical Manual of Mental Disorders</td>
</tr>
<tr>
<td>DTC</td>
<td>Delayed treatment control</td>
</tr>
<tr>
<td>EQ-5D</td>
<td>EuroQol five-dimension measure</td>
</tr>
<tr>
<td>GEE</td>
<td>Generalised Estimating Equation</td>
</tr>
<tr>
<td>IVR</td>
<td>Interactive voice response</td>
</tr>
<tr>
<td>MCAR</td>
<td>Missing completely at random</td>
</tr>
<tr>
<td>MDFT</td>
<td>Multi-dimensional family therapy</td>
</tr>
<tr>
<td>MET</td>
<td>Motivational enhancement therapy</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>MET+CBT</td>
<td>Motivational enhancement therapy combined with cognitive behavioural therapy</td>
</tr>
<tr>
<td>MI</td>
<td>Motivational interviewing</td>
</tr>
<tr>
<td>MTPRG</td>
<td>Marijuana Treatment Project Research Group</td>
</tr>
<tr>
<td>NCPIC</td>
<td>National Cannabis Prevention and Information Centre</td>
</tr>
<tr>
<td>NDSHS</td>
<td>National Drug Strategy Household Survey</td>
</tr>
<tr>
<td>NMDS-AODTS</td>
<td>National Minimum Data Set for clients of Alcohol and Other Drug Treatment Services</td>
</tr>
<tr>
<td>NSMHWB</td>
<td>National Survey of Mental Health and Wellbeing</td>
</tr>
<tr>
<td>PFR</td>
<td>Participant Feedback Report</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised controlled trial</td>
</tr>
<tr>
<td>SDS</td>
<td>Severity of Dependence Scale</td>
</tr>
<tr>
<td>SES</td>
<td>Socio-Economic Status</td>
</tr>
<tr>
<td>SSQ</td>
<td>Social Support Questionnaire</td>
</tr>
<tr>
<td>THC</td>
<td>Delta-9-tetrahydrocannabinol</td>
</tr>
<tr>
<td>TLFB</td>
<td>TimeLine Follow Back</td>
</tr>
<tr>
<td>WAI-S</td>
<td>Working Alliance Inventory Short-form</td>
</tr>
</tbody>
</table>
CHAPTER ONE: INTRODUCTION

Cannabis is the most commonly used illicit drug worldwide\(^1\) and is perceived to be inexpensive and easy to obtain by Australian illicit drug users.\(^2,3\) In a representative survey of the Australian community conducted in 2010, almost one in ten individuals approved of the regular use of cannabis by adults.\(^4\) Moreover, as cannabis is typically used experimentally or irregularly, the majority of cannabis users are not likely to experience any associated health concerns.\(^5-7\) However, the literature on cannabis smoking challenges the concept that the drug is benign for all users.\(^8\) The health-related consequences of use are known to be elevated when cannabis is used during adolescence or used frequently over time.\(^9\) As there are many cannabis users, the minority who seek treatment due to problematic use (approximately one in three of those with cannabis dependence will ever seek treatment in the US\(^10,11\)), represent a significant burden on drug-related health and welfare services. In fact, almost half (44%) of those presenting to drug treatment in Australia mention cannabis as a drug of concern.\(^12\)

The literature challenging the assertion that cannabis is benign for all users has identified five particular public health concerns that are associated with regular cannabis use. First, frequent cannabis use is associated with the development of cannabis dependence in adolescents and young adults (according to the most recent data published in 1997, approximately 30% of 18-24 year old Australian cannabis users met criteria for cannabis dependence\(^13\)), and cannabis withdrawal when use is ceased.\(^14,15\)

Second, mounting evidence supports an association between frequent cannabis use and an increased risk of developing psychotic symptoms among vulnerable people,\(^16-22\) and an emerging body of work also suggests an association with an increased risk of
depression. Third, heavy cannabis use compared to no use is associated with an increased risk of significant physical health problems, including respiratory problems, exacerbatation of existing cardiovascular disease, and death via fatal motor vehicle accident following impaired driving. Fourth, many cannabis users compound risks by using cannabis concurrently with other substances (92.8% of smokers over 14 years of age). Fifth, the early and frequent use of cannabis is associated with reduced educational achievement compared to non-users.

These public health concerns are significant given that cannabis use contributed to 0.2% of the total burden of disease and injury in Australia in 2003, or 10% of the burden relating to all illicit drugs. This translates to the loss of 5206 disability-adjusted healthy life years, which is more than the loss attributed to suicide and self-inflicted injuries relating to illicit drug use (4458 years). Moreover, the estimated annual costs for treating cannabis use disorders ranged between $16.9 million to $22.0 million dollars in 2007 for New South Wales alone.

This chapter provides an overview of the patterns and prevalence of cannabis use in Australia, the acute and chronic health effects of cannabis use, and the patterns and prevalence of cannabis treatment seeking. The following chapter summarises the literature on cannabis use treatments prior to discussing the aims and methodology of the present thesis, and its contribution to the evidence-base.

**PATTERNS, PREVALENCE AND PREDICTORS OF CANNABIS USE**

**Patterns of cannabis use**

The 2007 Australian National Drug Strategy Household Survey (NDSHS) identified that cannabis is predominantly smoked via one of two routes of administration. That is,
cannabis is typically smoked using a hand-made cigarette called a ‘joint’ (84.3% of cannabis users), and/or by using a water pipe (whereby the smoke passes through water before being inhaled) called a ‘cone’ or ‘bong’ (81.7% of cannabis users). The more recent 2010 NDSHS did not report on routes of administration but did indicate that it is common practice for cannabis to be smoked in conjunction with other substances (92.8% of cannabis users had used another substance in conjunction with cannabis at least once in the past 12 months). More specifically, on at least one occasion of recent use, cannabis smokers also concurrently drank alcohol (85.2%), and/or used tobacco (68.8%), ecstasy (23.9%), methamphetamine (17.6%), cocaine (12.3%) and/or another substance (35.7%). Males typically used these substances in conjunction with cannabis more commonly than females, particularly regarding the concurrent use of cannabis and ecstasy (26.4% males and 19.8% females).

A particular concern is the frequent practice of mixing cannabis with tobacco, or with alcohol. Data from the 1997 Australian National Survey of Mental Health and Wellbeing (NSMHWB) indicated that cannabis smokers were approximately four times more likely to smoke tobacco than non-cannabis smokers. Further, those who mix cannabis with tobacco consistently meet criteria for cannabis use disorders and more frequently have higher levels of psychosocial problems compared to cannabis-only smokers. Moreover, simultaneous cannabis and alcohol use is associated with increased risk of substance-related legal, academic, and relational problems among adolescents, and an increased symptom severity among individuals with psychosis.
Prevalence of cannabis use

The proportion of individuals reporting ‘recent’ cannabis use (within 12 months of data collection) has changed over time and is moderated by gender and age. After the proportion of individuals reporting recent use peaked in 1998 (17.9%), the proportion decreased to 9.1% in 2007, and then increased to 10.3% in 2010 (a statistically significant increase). In the 2010 NDSHS survey, males were more likely than females to have ever used cannabis (38.9% compared to 32.0%), and almost twice as likely to have used cannabis recently (12.9% compared to 7.7%). In contrast, among individuals aged 14-19 years, the rates of ever and recent cannabis use reported by males and females were similar (21.5% of males compared to 21.4% of females had ever used, and 15.9% of males compared to 15.5% of females had recently used). The 2010 NDSHS data also illustrated that the 40+ year age group had the highest proportion of daily users (17.6%) compared to the 12-17, 18-19, 20-29, and 30-39 year age groups (which ranged between 1.8% to 14.0%). In contrast, the 12-17 year age group was the most likely to use cannabis only once or twice a year (47.1%). Males were more likely than females to use cannabis daily, weekly or monthly (13.8%, 23.3%, 15.2% compared to 11.7%, 17.0%, 10.6%).

Roxburgh et al. highlighted the disparity between age groups and frequency of cannabis use by examining data obtained between 1993 and 2007 through three Australian national surveys (the NDSHS, the Australian Secondary Student Alcohol and Drug Survey, and the National Hospital Morbidity Database). Daily cannabis use in the 12 months prior to survey was consistently seen to be most prevalent among 40-49 year olds and was associated with increases in hospital treatment presentations compared to the younger age groups. This group of older users, however, did not typically report
heavy daily use of cannabis (more than 10 cones or joints per day). This quantity of use was more frequently reported by daily users aged 10-19 years.

The fact that older users smoke more frequently but in lower quantities per day of use is not well explained. Research regarding the motivations of older smokers to continue smoking cannabis is yet to be conducted. Those in the 40-49 year age group, however, likely represent a minority of individuals who use cannabis as a routine lifestyle choice, and use in less quantity than younger smokers who use for enjoyment and to enhance social activities. This is consistent with longitudinal research illustrating that maturation and changes in life circumstances, such as having children and occupational activity, predict cannabis use cessation.

Predictors of cannabis use

The predictors of initiation to cannabis use have been investigated by three separate large cohort longitudinal studies (totalling 38,597 participants) over two to four years in Norway, the US, and Australia. Across these three studies, adolescents were more likely to initiate cannabis use during the later years of high school if their peers used cannabis, cannabis was easily accessible, they smoked tobacco daily, consumed alcohol frequently and heavily, or they reported antisocial behaviours or interpersonal and family conflict (particularly parental divorce). These factors individually increased the likelihood of initiating cannabis use by a mean of 2.5 to 3.9 times. In an older cohort (minimum of 21 years) the onset of cannabis use was predicted by alcohol and tobacco use disorders, and co-morbidity with other mental health disorders. These risk factors increased the likelihood of initiating to cannabis use by a mean of 1.2 to 3.3 times. In contrast, religious attendance, participation in volunteer work and becoming a parent
were predictors of never smoking. These protective factors increased the likelihood of never using by a mean of 1.4 to 1.9 times.\textsuperscript{53}

**INTERNATIONAL EPIDEMIOLOGY OF CANNABIS USE**

The patterns and prevalence of cannabis use is not uniform throughout the world.\textsuperscript{54} The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) recently gathered national survey data from countries throughout the world and reported on the frequency of cannabis use by the younger age groups (15-34 years).\textsuperscript{54} The prevalence of cannabis use in Australia (based on 2007 data) was seen to be substantially higher than average European estimates (based on data collected between 2001 and 2010), but below that of the US (based on 2010 data) and Canada (based on 2009 data). The frequency of lifetime and last year cannabis use in the US population (aged 15-34 years) was 51.6\% and 24.1\%, and in Canada it was 48.4\% and 21.6\%, respectively, compared to 46.7\% and 16.2\% in Australia.\textsuperscript{54} European estimates of lifetime and last year cannabis use were lower at 32.0\% (ranging between 2.9\% in Romania to 45.5\% in the Czech Republic) and 12.1\% (ranging between 0.9\% in Romania to 21.6\% in the Czech Republic), respectively.

The EMCDDA also reported on disparities between the genders and frequency of cannabis use throughout European countries.\textsuperscript{55} In 2003, lifetime experience of cannabis use was generally higher among adult males compared with females in European countries (a ratio of 1.25 to 4.0). However, consistent with Australian data, frequency of cannabis use was more similar between genders among the younger age groups (males were estimated throughout Europe to be at most 1.8 times more likely than females to use cannabis).\textsuperscript{55}
It is difficult to make accurate population level comparisons between countries regarding the prevalence of recent cannabis use as population surveys are not conducted in the same manner, or on the same timeline, and categorise individuals’ ages differently. In the absence of a global survey, one method to estimate the global prevalence of recent cannabis use is to first acknowledge the differences between different national surveys, and second, make visual comparisons between the prevalence estimates presented by individual countries. As shown in Table 1.1, according to the most recent estimates, just under one in ten individuals have used cannabis recently across the globe.

### Table 1.1 International prevalence rates of recent cannabis use

<table>
<thead>
<tr>
<th>Country</th>
<th>Drug use survey</th>
<th>Year</th>
<th>Included ages (years)</th>
<th>Recent cannabis use (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>National Drug Strategy Household Survey</td>
<td>2010</td>
<td>12+</td>
<td>10.0</td>
</tr>
<tr>
<td>US</td>
<td>National Survey on Drug Use and Health</td>
<td>2010</td>
<td>12+</td>
<td>5.8</td>
</tr>
<tr>
<td>European countries</td>
<td>n/a*</td>
<td>2010</td>
<td>15-64</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Range*: 0.4 – 14.3</td>
</tr>
<tr>
<td>Canada</td>
<td>Canadian Alcohol and Drug Use Monitoring Survey</td>
<td>2010</td>
<td>15+</td>
<td>10.7</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Alcohol and Drug Use Survey</td>
<td>2007</td>
<td>14-64</td>
<td>14.6</td>
</tr>
</tbody>
</table>

* A number of European countries provided separate survey data to the EMCDDA such that a prevalence estimate of 6.7% for recent cannabis use throughout Europe could be made.

**PSYCHOPHARMACOLOGY OF CANNABIS USE**

Research on the psychoactive properties of the cannabis plant, in addition to a growing body of literature on its endogenous effects, has led to the identification of the active components within the cannabis plant as well as the reactive components in the brain. The active components in the cannabis plant are chemicals unique to the plant, known as cannabinoids, of which delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) are of particular interest. These cannabinoids are thought to have opposing properties,
where THC is the main psychoactive component of cannabis, while CBD has anti-psychotic and anxiolytic properties.\textsuperscript{59} For this reason, CBD is capable of moderating some of the psychoactive effects of THC.\textsuperscript{60-63} The two main endogenous reactive components that interact with cannabis (specifically with the psychoactive THC) are known as ‘cannabinoid 1’ (CB1) and ‘cannabinoid 2’ (CB2).\textsuperscript{64, 65} In addition, the CB1 and CB2 receptors respond to the action of two endogenous chemicals which mimic the properties of exogenous cannabinoids; namely, anandamide and 2-arachidonoylglycerol.\textsuperscript{66} The CB1 and CB2 receptors are diversely distributed throughout our body, with the highest concentration in our cerebral cortex.\textsuperscript{64, 65, 67, 68}

In addition to reacting with the CB1 and CB2 receptors, THC has been observed to interact with neurons in our brain that release dopamine, glutamate and acetylcholine.\textsuperscript{66, 69-71} It is the combination of these interactions, and the location of the cannabis receptors in our brain (areas responsible for cognitive functioning), that may explain the experience of euphoria following consumption and some individuals’ motivation to continue use.

**MOTIVATIONS FOR CANNABIS USE**

Knowledge regarding an individual’s motivation(s) for using cannabis may assist in understanding the quantity and frequency of use as well as the consequences of using cannabis. In this respect, cannabis use treatments are strengthened by identifying motivations for using cannabis. In early research the expected motives for using cannabis were initially thought to mirror motivations for using alcohol.\textsuperscript{72} The four main motives included reducing negative affect or enhancing positive affect, enhancing creativity, improving social cohesion, and satisfying an addiction to use.\textsuperscript{72} Further research identified the unique nature of the psychoactive effects of cannabis compared
to alcohol, and expanded the considered motives to include the enhancement of perceptual and cognitive experience,[^73] and later included using for enjoyment or fun, experimental use, using to relieve boredom, and using to assist relaxation.[^50]

The initial study to include the full list of cannabis motives also measured the frequency of cannabis used by 634 students, and the experience of cannabis-related problems.[^50] The authors indicated that enjoyment/fun (52.1%), social cohesion (42.8%), and experimentation (41.3%) were the most frequently endorsed motives by participants, while experimentation (41.3%) then addiction (1.0%) and coping (18.1%) accounted for the most unique variance regarding frequency of use and related consequences among recent high school graduates.[^50] That is, frequent cannabis use and increased cannabis-related problems, were predicted by using out of habit, or to help cope, while experimental use predicted less frequent use. This finding was supported by further research involving adolescent populations where coping motives predicted greater frequency of use and negative cannabis-related problems compared to social motives.[^74][^75]

Irrespective of what motivates an individual to use cannabis, the effects from smoking cannabis typically begin to occur within a few minutes, and peak within approximately one to two hours.[^76][^77] A review of 12 naturalistic and 18 laboratory studies which included frequency data on the self-reported subjective effects of cannabis use has provided some insight to the effects from smoking.[^78] Great variation in the reported effects was noted, although the most commonly reported subjective effect from smoking was a feeling of relaxation.[^78] The variation in responses can be partially explained by the mediating effects of the drug itself (in terms of dose, purity and mode of administration), the user (in terms of mood, attitudes, tolerance, susceptibility, prior
experience and psychiatric symptoms), and the environment it is used in (in terms of social setting). Aside from subjective effects, literature regarding the *health* related effects of cannabis use is extensive and is briefly summarised here.

**HEALTH EFFECTS OF CANNABIS USE**

The extent to which smoking cannabis causes negative health effects is heavily debated. This is partly due to the fact that a fatal dose of cannabis is beyond that which any user could realistically smoke or eat (the estimated acute lethal blood concentration is at 180-315 μg/L). Further, the available data regarding the causal or indirect mortality pathways is insufficient to make a reliable conclusion as to the risk that smoking cannabis poses to mortality. Regardless of mortality risk, however, cannabis use is associated with a number of adverse health effects and psychosocial outcomes which are briefly summarised here.

**Adverse health effects relating to acute cannabis use**

Acute cannabis use refers to irregular cannabis use on one or more occasions over a short period of time. The adverse health effects that are most commonly associated with acute cannabis use include increased heart rate leading to increased risk of heart attack, and cognitive impairments leading to increased risk of injury or death by motor vehicle accident and an increased level of impulsivity in decision making.

*Cannabis use and increased risk of cardiovascular events or disease*

Both human and animal trials have shown that acute cannabis smoking produces dose-related increases in heart rate. The increase in heart rate may be a concern for individuals who have a low tolerance for such change. That is, research suggests that young adults are likely to experience only a mild stress to their heart which decreases as
tolerance develops. However, older adults, particularly those with ischaemic heart disease, hypertension, and cerebrovascular disease, are at greater risk of experiencing cardiovascular upset following cannabis smoking. This finding has been supported in several laboratory studies of patients with existing heart conditions, where smoking cannabis exacerbated symptoms of heart disease. Further, a large study of 3882 patients who had suffered myocardial infarction (heart attack) detailed that those who had smoked cannabis (3.2% of the sample) had an increased risk of heart attack by 4.8 times within the first hour of smoking (the risk dramatically reduced after one hour). Accordingly, acute cannabis smoking is a particular concern for individuals with cardiovascular disease.

*Cannabis use and cognitive impairment causing increased risk of injury by motor vehicle accident*

It is clear from experimental study that cannabis use can effect cognitive performance in a number of ways, particularly when administered in high doses (at least 15mg of THC). Further, extensive research indicates that heavy users (at least 10 cones or joints per week), and those who initiate cannabis use early (prior to 15 years), frequently show reduced cognitive capabilities compared to non-users. The most commonly reported impairments include a reduced short term memory (working memory and verbal episodic memory), attention span, and processing speed and overall IQ. However, research regarding the real-world impact of the cognitive impairments following acute use is less clear. In particular, research regarding whether these impairments can lead to personal injury through motor vehicle accident is somewhat mixed.
A number of laboratory studies have cited that cognitive impairments observed following cannabis use can impact on the cognitive abilities and motor skills required when driving a motor vehicle. 93-105 These studies typically use performance tests that are designed to simulate driving situations. One might argue that these simulations cannot compare with actual driving. However, recent research has combined performance test data with real-world data and found these simulation studies to be valid measures in predicting increased risk of injury by motor vehicle accident. 106 In addition, a meta-analysis of experimental studies has identified that a THC concentration of 7-10ng/ml in blood serum would result in a comparable risk-of-accident to a blood alcohol content of 0.05%. 107

Despite these findings, using laboratory data to predict real-world outcomes of cannabis use in the context of driving and collision risk is thought to be limited in comparison to observational epidemiological studies of driving in the general population. 108 Unfortunately, the epidemiological literature regarding the presence of a statistical link between cannabis use and involvement in a motor vehicle accident is mixed. Several studies support the link, 109-115 while several other studies do not report a statistically significant association. 116-121 The frequency to which cannabis use is identified among drivers involved in fatal and non-fatal motor vehicle accidents has been reviewed by Macdonald et al. 122 This review summarised 26 studies where the frequency of cannabis involvement was between 1.4% and 27.5% (7.8% on average) among fatal crashes and between 5% and 16.9% (11.9% on average) among non-fatal crashes.

The epidemiological literature typically does not control for other substance use, including alcohol or amphetamine use, which is common among those suspected of driving under the influence of a drug. 122-124 Further, these studies often do not
incorporate a control group in order to allow the relative risk of cannabis use to be estimated. Finally, in the context of epidemiological studies, cannabis use often is identified by a positive blood test which is unable to provide evidence of intoxication at the time of accident (the tests are mostly calibrated to identify THC-COOH, an inactive metabolite of THC). \(^{124-126}\) A recent study highlighted the importance of identifying intoxication at the time of the accident. \(^{127}\) In this longitudinal study spanning one year, 68 of 503 young cocaine and cannabis using participants were involved in a motor vehicle accident following the use of cannabis within one to two hours prior to the incident. The risk of accident dropped from a relative risk ratio of 7.0 when cannabis was smoked within one hour, down to 2.2 when smoked within two hours, after controlling for other substance use. As such, the authors concluded that epidemiological study identifying cannabis use involvement in motor vehicle crashes should be wary when attributing a causal relationship, particularly without first identifying intoxication at the time of accident.

Case-control and cohort studies have since provided further investigation of cannabis use and driving. Unfortunately, results from these studies also have been inconsistent. \(^{101, 122, 128, 129}\) Another form of a case-control design is that of culpability studies where drivers are separated into two groups by being culpable for the motor vehicle incident or not. Here, individuals who report driving under the influence of cannabis (DUIC) are expected to be more likely to be found culpable of an accident than those who are unimpaired. However, these culpability studies also have produced mixed results. \(^{126, 130-133}\)

The great variability in research on cognitive impairment and reduced motor coordination leading to increased risk of motor vehicle accident prompted a recent
systematic review and meta-analysis of the literature. This investigation separated observational epidemiological studies from case-control studies, and culpability studies. Among observational studies, the pooled relative risk of being involved in a motor vehicle accident was 1.92 times higher (95% CI=1.35-2.73, with 81% heterogeneity among studies) when DUIC than when driving unimpaired. The pooled estimate of relative risk was slightly greater among case-control studies, with a pooled risk of 2.79 (95% CI=1.23-6.33), and among culpability studies involving fatal crashes, with a pooled risk of 2.10 (95% CI=1.31-3.36). Notably, culpability studies involving non-fatal crashes did not show a statistically significant increase in risk of crash when DUIC than when driving unimpaired.

Taken as a whole, the literature suggests that the cognitive impairments caused by cannabis use can result in a near doubling of the risk of motor vehicle accident. Given the prevalence of cannabis use and the seriousness of motor vehicle accidents this is a major public health concern.

*Acute cannabis use and increased levels of impulsivity*

Finally, acute cannabis use may result in a cognitive change during intoxication that promotes impulsive decision making. This link has been supported by a growing body of research which includes studies of participant self-report, neuroimaging studies, and studies using measures of behavioural impulsivity. Impulsive decision making brought on by cannabis use could lead to poorer health by not paying due heed to health warnings or to the negative consequences when making behavioural decisions.
Adverse health effects relating to chronic cannabis use

Chronic cannabis use refers to regular cannabis use (daily or near daily) that persists for more than one year. The adverse health effects relating to chronic cannabis use have received extensive attention and are the subject of continuing debate. The most common adverse health effects associated with chronic cannabis use include cannabis use disorders, as well as the development of anxiety and panic attacks, cannabis-related psychosis, schizophrenia, cancer, and respiratory impairment.

Cannabis use disorders and withdrawal from cannabis use

National surveys have established that cannabis use disorder (CUD; including cannabis abuse and cannabis dependence) is the most common illicit drug use disorder in the US (1.7% of the population in 2009) and Australia (2.2% of the population according to the most recently published data which was collected in 1997). On the basis of such studies, Hall and Pacula estimated that approximately one in ten people who had ever used cannabis will become dependent, and when cannabis is used daily, the risk increases dramatically to one in two. In the national surveys, rates of dependence tend to be higher among young people and males (an elevated risk of approximately four times), and have increased over the last two decades.

Those with CUD typically report smoking despite social, psychological, and physical impairments, and commonly cite consequences such as relationship and family problems, guilt associated with use of the drug, and low life satisfaction. The onset of CUD most commonly occurs in adolescence or young adulthood, within 10 years of initiation. Despite its clinical significance, few studies have investigated the predictors of CUD. However, in the limited research available, aside from being an adolescent or a male, the factors thought to increase the risk of CUD include having
greater access to cannabis, a lower socio-economic status, a co-morbid substance use disorder, living in an urban centre, experiencing early parental death, and using cannabis more frequently and in greater quantity.\textsuperscript{150-152}

An emerging consensus is that the concept of cannabis abuse and dependence and cannabis withdrawal may each be part of a single factor or continuum of CUD severity.\textsuperscript{153} This theory is supported by the proposed changes in the upcoming fifth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) whereby the distinction between abuse and dependence is to be removed for all drugs and, for cannabis, the withdrawal criteria is to be included.\textsuperscript{14, 154}

Although the most recent DSM-IV recognises cannabis use disorders (abuse and dependence), it does not recognise a withdrawal syndrome.\textsuperscript{155} Despite this, many users have described such a withdrawal syndrome.\textsuperscript{156-165} Recent advances in the pharmacological research provide some insight into the mechanisms of cannabis withdrawal.\textsuperscript{157, 166-168} Specifically, in animal studies, CB1 receptor antagonists have been shown to interact with CB1 receptor sites and precipitate symptoms of withdrawal.\textsuperscript{168, 169} In addition, observed increases in a corticotropin-releasing factor, and reduction in dopamine cell activity, during withdrawal from THC reflect actions seen in withdrawal from opiates.\textsuperscript{168, 170, 171}

The withdrawal syndrome has recently been investigated among 45 dependent cannabis users who ceased cannabis use for two weeks (verified by urinalysis).\textsuperscript{15} The withdrawal symptoms most frequently described included nightmares and/or strange dreams (41%), trouble getting to sleep (37%), waking up early (33%), and being easily irritated (30%). This study also uniquely asked participants to quantify the distress associated with each symptom (referred to as withdrawal ‘intensity’). In this respect, participants most
commonly reported trouble sleeping, angry outbursts, imagining being stoned and having no appetite as causing the most distress. Participants with higher severity of dependence ($n=24$; a score greater than 7 on the Severity of Dependence Scale) reported a greater increase in the magnitude, and duration of withdrawal, compared to those with low dependence ($n=21$; scoring less than 8). All participants, however, reported mild to moderate withdrawal intensity scores.

**Cannabis use and anxiety**

The association between symptoms of short-lasting episodes of anxiety and cannabis use is somewhat paradoxical. That is, anxiety is among the most commonly reported adverse effects of cannabis use, particularly by those who subsequently abstain from further use. Yet, anxiety is also associated with cannabis use in the context of being a withdrawal symptom, and is an identified cause for cannabis use relapse. This unusual relationship has been elucidated by three main findings reported in a review of the evidence linking cannabis use with symptoms of anxiety.

First, the review reported that experimental studies involving the administration of THC (largely taken orally in tablet form) to inexperienced users have identified a statistically significant increase in symptoms of anxiety resembling panic attacks. Specifically, participants from eight of 10 studies (involving between eight and 40 participants per study) reported a statistically significant increase in symptoms of anxiety and panic as measured by scores on a visual analogue scale and the State-Trait Anxiety Inventory. In addition, five experimental studies with long term cannabis users have identified a statistically significant *reduction* in symptoms of anxiety following oral administration of CBD. Finally, recent research suggests that using cannabis to reduce tension is
typical of long-term users seeking cannabis use treatment. For these individuals, learning skills to reduce tension promoted cannabis use reduction.

Second, self-reported symptoms of anxiety were frequently cited in eight further studies regarding the characteristics of long-term cannabis users. This was particularly the case among individuals with cannabis dependence (8% to 33% of occasional non-dependent users, and 36% to 83% of users with cannabis dependence).

Third, nine additional epidemiologic studies comparing those with a cannabis use disorder (CUD) with non-users in the general population, depicted a higher prevalence of co-morbid panic disorder and social anxiety disorder diagnoses among those with CUD (between 13% to 31% of dependent users, compared to approximately 5% of non-users). The temporal order of the onset of these disorders and CUD diagnoses was not investigated in these studies. However, more recent evidence from the 2001-2002 US National Epidemiological Study of Alcohol and Related Conditions suggests that social anxiety is likely to predate cannabis dependence. In this study, 81.5% of 340 co-morbid cases reported onset of social anxiety disorder prior to cannabis use disorder.

As such, the relationship between symptoms of anxiety and cannabis use appears to be contingent on the naivety or relative experience of the cannabis user, and the ratio of THC and CBD in the cannabis used. Notably, it is not well understood if cannabis use may cause long-term anxiety which continues even in the absence of subsequent use as few individuals with co-morbid anxiety and cannabis use disorders cease using cannabis.
Cannabis related psychosis and schizophrenia

A strong evidence base suggests that long term and frequent cannabis use is associated with an increased risk of developing psychotic symptoms compared to infrequent use and non-use.\textsuperscript{16,17} Two recent meta-analysis of the available evidence concluded that individuals who have tried cannabis are likely to develop psychotic symptoms an average of 2.7 years before their non-using counterparts,\textsuperscript{17} and are at approximately 40\% greater risk of psychosis than non-users.\textsuperscript{16} A dose response was depicted in these meta-analyses. First, the risk of developing psychotic symptoms increased by 1.4 (95\% CI=1.2-1.7) for ever using cannabis, and by 2.1 (95\% CI=1.5-2.8) when using cannabis frequently.\textsuperscript{16} Second, the average onset age was an additional 0.65 years earlier for heavy users than light users (2.72 and 2.07 years prior to non-users, respectively).\textsuperscript{17} This dose response highlights that early use of cannabis is important, as early users tended to use more frequently. Given the evidence of a strong association and correct temporal order, these results support the hypothesis that cannabis use could play a causal role in the development of psychotic symptoms for some individuals.

There is a distinction between psychotic symptoms and a psychotic disorder, such as schizophrenia. The symptoms of schizophrenia include positive symptoms (hallucinations, delusions, thought disorder and paranoia), negative symptoms (apathy, low motivation, social withdrawal, and emotional deficit), and cognitive deficit (impairments to memory, attention and executive functioning). Schizophrenia may be diagnosed in the presence of two or more of these symptoms that continue for at least one month.\textsuperscript{155} The association between cannabis use and its impact on the development and course of schizophrenia also has received a great deal of scholarly attention, with the majority of literature investigating the positive symptoms of schizophrenia.\textsuperscript{183-187}
These studies have identified that individuals with schizophrenia are more likely than the general population to use cannabis. Cannabis use also is thought of as a risk factor for developing schizophrenia (odds between 1.5 and 4.3 times greater), although the incidence of developing schizophrenia among cannabis users is low given the low base rate of the disorder.  

The notion that cannabis contributes to the onset of schizophrenia is strongly debated. Indeed, establishing any causal factor of schizophrenia is difficult given the subjectivity of diagnosis, a lack of biological test for schizophrenia, and a lack of clarity surrounding the associated biological processes. In review of the associated research, Casadio et al. concluded that cannabis use may be more likely to be a contributing factor, along with other factors such as genetics (referring to family history and other vulnerability) and the environment (including childhood trauma), that leads to a diagnosis of schizophrenia. Although not identified by Casadio et al., gender may be important with a greater incidence of first-onset schizophrenia in males compared to females (incidence rate ratio of 2.3, 95% CI=1.7-3.1). However, this difference may reflect frequency of cannabis use, as males more commonly report ever using cannabis than females (in Australia, 38.9% males report ever using compared to 32.0% females). The effect of cannabis on the cognition of individuals with schizophrenia who use cannabis is unclear, with little research conducted without the confounding influences of other substance use. A recent review of eight studies of individuals diagnosed with schizophrenia (totalling 356 cannabis using participants, and 586 who did not use cannabis or other substances) has provided some detail as to the effect of using cannabis by this population. Cannabis using participants with schizophrenia had statistically significantly greater severity of positive symptoms than non-users with
schizophrenia, and comparable negative symptoms (positive and negative scores of 18.7 and 18.0, compared to 14.6 and 18.5, respectively). The baseline difference of using cannabis was also found to improve cognitive performance in seven domains, although the effect size of these improvements were very small to medium (Cohen’s $d=0.1$ to 0.5; reflecting improvement in receptive and expressive language ability to general cognitive ability and intelligence, where 0.2 represents a small effect and 0.5 represents a medium effect).\textsuperscript{208}

These improvements, however, may be limited to individuals reporting chronic cannabis use.\textsuperscript{209} A study of the dose-related effects of cannabis (THC) delivered intravenously (that is, short term effects without repeated administration) in 13 patients diagnosed with schizophrenia with limited experience of cannabis use (typically less than five lifetime exposures with last exposure typically more than ten years in the past) compared to healthy subject controls did not show significant benefit to cognitive performance.\textsuperscript{209} Specifically, patients diagnosed with schizophrenia performed more poorly on verbal memory and attention tasks compared to control, and both groups performed worse on these tasks compared to placebo. This finding was consistent with epidemiological studies supporting an exacerbation of symptom severity among cannabis users compared to non-users.\textsuperscript{183,187} In addition, individuals diagnosed with symptoms of psychosis who smoke cannabis have been shown to experience relapse to psychosis more frequently,\textsuperscript{185,186} and are less compliant with treatments than non-users.\textsuperscript{185}

Taken together, the evidence demonstrates that the chronic use of cannabis is a risk for the development of psychotic symptoms, particularly when it is used early and frequently by individuals with a predisposition for developing psychotic disorders. The
literature regarding the chronic use of cannabis by individuals diagnosed with schizophrenia suggests a resulting increase in positive symptoms, as well as some improvement in cognitive ability, although this literature is limited and requires further study to make definitive conclusions.

*Cannabis use and cancer*

Although THC is not carcinogenic,\(^{210,211}\) cannabis contains carcinogens in its smoke, some of which occur in higher levels than tobacco.\(^{212,213}\) A specially designed smoking machine “smoked” 30 cigarettes of cannabis and tobacco using standardised conditions (set out by the International Organization for Standardization, Routine Analytical Cigarette-Smoking Machine) and recorded levels of ammonia in cannabis smoke up to 20 fold greater than in tobacco, and hydrogen cyanide and nitrous oxide at concentrations three to five times greater.\(^{213}\) The presence of these chemicals was explained by the high burn temperatures used in smoking the cannabis cigarettes and the nitrates in the soil of the cannabis plant, although no research has been conducted to verify this claim. As these chemicals are known to be carcinogenic, it is therefore reasonable to assume that, like tobacco, cannabis smoking may contribute to the development of cancer.\(^{214}\) This assumption has been the focus of two cohort studies,\(^{215}\) and several case-control studies.\(^{217-231}\) Each of these studies are summarised here.

A large cohort study conducted by Efird et al. observed the risk of developing a brain tumour when smoking tobacco, or cannabis, or both.\(^{215}\) These authors observed the smoking behaviours of 105,005 participants aged at least 25 years who were recruited among individuals presenting for health check-ups between 1977 and 1985 in Northern California. The authors concluded that smoking cannabis at least once a month increased the relative risk of a malignant primary adult-onset glioma (brain tumour) by
almost three times after adjusting for tobacco smoking ($RR=2.8; 95\% CI=1.3-6.2$). Notably, no such statistically significant relationship was found when cannabis was used less than once a month.

A second large cohort study of 64,855 participants recruited in the same way (patients aged 15 to 49 years presenting for health check-ups in the US between 1979 and 1985) investigated the incidence of any cancer, not just brain cancers. These authors compared any use of cannabis to no use, current use, and former use, and adjusted for tobacco smoking and alcohol use. No statistically significant increase in overall cancer rates among cannabis users was observed, with the exception of increased rates of prostate cancer in non-tobacco smoking men who ever used cannabis or used cannabis at the time of study ($RR=3.1, 95\% CI=1.0-9.5$, and $RR=4.7, 95\% CI=1.4-15.5$, respectively).\textsuperscript{216}

There is an approximately even split between case-control studies which have not found a statistically significant association between cannabis use and cancer,\textsuperscript{217, 219-224, 227} and those that have.\textsuperscript{218, 225, 226, 228-231} Table 1.2 provides a brief summary of those studies reporting a statistically significant relationship and highlights the likelihood that cannabis use was associated with an increased incidence of cancers. The relative risk of developing cancer was mediated by cannabis use frequency and duration among these studies, ranging from an increased risk of 20\% to 570\% (see Table 1.2). Notably in one study,\textsuperscript{230} cannabis use was found to decrease the risk of developing cancer (in this case head and neck cancer).
<table>
<thead>
<tr>
<th>Author</th>
<th>Number of cancer participants, type of cancer</th>
<th>Number of healthy control participants</th>
<th>Frequency of cannabis use reaching significance</th>
<th>Relative risk ratio (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldington et al. (2008)</td>
<td>79, lung cancer</td>
<td>324</td>
<td>&gt;10.5 joint years</td>
<td>5.7 (1.5-21.6)</td>
</tr>
<tr>
<td>Chacko et al. (2006)</td>
<td>52, lung cancer</td>
<td>104</td>
<td>Ever smoked</td>
<td>3.4 (?)</td>
</tr>
<tr>
<td>Zhang et al. (1999)</td>
<td>173, head and neck cancer</td>
<td>176</td>
<td>Ever smoked</td>
<td>2.6 (1.1-6.6)</td>
</tr>
<tr>
<td>Feng et al. (2009)</td>
<td>636, throat cancer</td>
<td>615</td>
<td>More than 2000 occasions</td>
<td>2.6 (1.0-6.9)</td>
</tr>
<tr>
<td>Berthiller et al. (2008)</td>
<td>430, lung cancer</td>
<td>755</td>
<td>Ever smoking</td>
<td>2.3 (1.5-3.6)</td>
</tr>
<tr>
<td>Liang et al. (2009)</td>
<td>434, head and neck cancer</td>
<td>547</td>
<td>10-20 joint years</td>
<td>0.4 (0.2-0.7)</td>
</tr>
<tr>
<td>Trabert et al. (2011)</td>
<td>187, testicular germ cell tumours</td>
<td>148</td>
<td>Daily or greater</td>
<td>2.2 (1.0-5.1)</td>
</tr>
</tbody>
</table>

Note: all studies controlled for tobacco use and all comparisons were made with non–cannabis using age-matched control subjects; "?”=this article did not report the 95% confidence interval

* In Liang et al.’s study, the incidence of cannabis use actually reduced the risk of cancer

Overall, given that several studies have reported results demonstrating a lack of association between cannabis smoking and cancer, caution should be taken in the interpretation of results, and there is a need for further supportive research. Explaining the variation between studies is difficult. There is a clear need for standardisation in quantifying cannabis use between studies, and the possibility of unmeasured confounding factors in both the patients and age-matched controls (such as family history of cancer) must be addressed. Further, the biological pathway between cannabis use and the subsequent development of cancer is not well understood.
Respiratory impairment

The smoke inhaled during cannabis use enters the bronchial passage and comes into direct contact with airway mucosa and the surface of the lung before being absorbed into circulation. Following acute cannabis use there is clear evidence of increased airway resistance due to bronchoconstriction (a reduction in airway size, with reported reductions in the range of 8% to 48%). However, this increase is not likely to be of clinical significance, and tolerance is thought to be developed after several weeks of use. The effects on the respiratory system following chronic cannabis use are thought to be more substantial.

Population based studies that control for tobacco use have consistently reported a higher frequency of cough and sputum production, and to a lesser extent wheezing, among regular cannabis smokers compared with non-smokers. A growing body of literature has assessed the impact of cannabis use in terms of airway obstruction, typically by measuring the amount of air that can be forcibly expired in one second. Using this measure, a number of studies depict a relationship between regular cannabis use and increased airway obstruction compared to no use, although this finding is not supported in other similar research. Unfortunately, the studies remain inconsistent, often lack adequate control for other substance use (including tobacco use), and do not standardise the measures of cannabis use frequency that are employed.

Regardless of an effect on airway obstruction, observation of bronchoscopic and mucosal biopsy consistently highlights that the chronic use of cannabis is associated with mucosal injury. Further, alveolar macrophage - an immune cell produced in response to the ingestion of toxic agents - is found in greater quantity by tobacco and
cannabis smokers than non-smokers.\textsuperscript{262,263} In addition, the effectiveness of macrophages in destroying harmful bacteria that are produced by cannabis smokers is reduced compared to non-smokers,\textsuperscript{264-266} which can moderate the immune system effectiveness and enhance disease processes.\textsuperscript{267}

The presence of bullous lung disease or emphysema (the presence of abnormal airspaces in the lung resulting from the destruction of wall tissue) has been reported by cannabis smokers.\textsuperscript{268-275} Whether this disease is likely to lead to pneumothorax (an abnormal amount of gas that separates the lung from the chest wall) is in contention. A number of case series have made this observation,\textsuperscript{251,268-272} while other similar study does not support the link between the bullous disease and consequent pneumothorax.\textsuperscript{273-275} A novel study which directly compared cannabis only smokers to tobacco only smokers and non-smokers did not report a statistically significant increase in the rates of pneumothorax among cannabis smokers, but found a statistically significant increase in tobacco smokers.\textsuperscript{276} In review of the literature, a causal link between cannabis use and emphysema and subsequent pneumothorax has been refuted in the absence of further research.\textsuperscript{30,277}

Overall, the literature suggests that smoking cannabis can have a negative impact on respiratory health. That is, smoking cannabis in the long term is likely to cause symptoms of bronchitis, such as coughing and sputum production, and damage mucosa - thus impairing the immune response to ingesting toxins in the cannabis smoke. The extent to which these effects on the respiratory system create an obstruction to the airway, or result in emphysema, remains unclear without further research controlling for tobacco use and other confounding issues such as environmental exposure to other toxins.
Cannabis use and its effects on educational attainment

In addition to the adverse health effects of cannabis use, a growing literature has identified that, compared to no cannabis use, early use of cannabis (typically described as use before 16 years) is associated with increased rates of school dropout,\textsuperscript{278-285} failure to attend tertiary education,\textsuperscript{281, 284, 286} and failure to attain a university degree.\textsuperscript{281, 285, 286} In addition, a very recent analysis of data from the Dunedin Study - a prospective study of a birth cohort which was followed up to age 38 years - found that persistent frequent cannabis use was linked with significant cognitive impairments as measured by reductions in their intelligent quotient (IQ).\textsuperscript{287} The associations between cannabis use and poorer educational achievements remain when controlling for social context and several other possible confounding causative factors including prospectively assessed covariates, indicating that cannabis use is most likely to occur prior to poor educational achievement.\textsuperscript{36, 37, 280-283, 285, 287-289} When ongoing use is frequent and early (chronic use) the impact on educational outcomes is increased.\textsuperscript{278, 280, 286} In research that separates the genders, the impact of cannabis use in regards to rates of school dropout appears similar, however, males may experience more occupational impairment compared to females.\textsuperscript{284} This finding is perhaps due to a reduced likelihood of cannabis smoking males attending tertiary education compared to females.\textsuperscript{285, 290}

Two prominent models may explain the associations between early and frequent cannabis use and reduced educational outcome. In the first model, using cannabis early is thought to introduce the young person to social contexts which discourage educational achievement and encourage participation in youth culture and related activities.\textsuperscript{291-294} In the second model, early cannabis use is thought to produce cognitive structural and functional changes which result in reduced motivation to attend school.
and learning impairment.\textsuperscript{295-297} A less prominent third model should also be considered. That is, there may be a causative factor that is associated with both cannabis use and poor educational outcomes that has not yet been adequately controlled for in the current research. One such factor may be an aspect of poor mental health that lies out of the scope of the included measures and remains to be identified in the limited research available.

Further research is required to elucidate a more sophisticated model which may combine these models. This research will necessarily require a greater attempt at controlling for a variety of confounding factors as previous research lacks urban and rural comparisons, and suffers from over-representation of economically disadvantaged individuals in loss to follow-up.\textsuperscript{36-38}

**RESPONDING TO THE ADVERSE HEALTH EFFECTS OF CANNABIS USE**

Most cannabis users who use less than weekly will abstain from use after experiencing adverse consequences over time.\textsuperscript{151, 298} Although most users do not require treatment, it is due to the large numbers of cannabis users, that cannabis treatment is important from a public health perspective.\textsuperscript{299}

**Patterns and prevalence of cannabis treatment seeking**

Even among the most entrenched cannabis users, seeking professional treatment within a given year is not common. Before accessing professional treatment, the typical dependent cannabis user will first attempt to stop using cannabis unsuccessfully on an average of more than six times,\textsuperscript{300} have used cannabis almost daily for an average of more than 10 years,\textsuperscript{300} or have cannabis abuse and dependence for 5.5 and 3.1 years,
respectively. The US National Co-morbidity Survey offered a rare look into the predictors of treatment seeking among those with cannabis dependence. This survey included a ten year follow-up (baseline was conducted between 1990 and 1992) and identified that being single, failing to graduate high school, previously attending treatment for emotional and/or substance use problems (the particular substance was not identified), and the co-morbidity of major depression (past year), and alcohol dependence predicted past-year treatment seeking.

In Australia, similar characteristics are surveyed upon admission to primarily government funded and some non-government funded organisation treatment facilities through the mandatory reporting of the National Minimum Data Set for Clients of Alcohol and Other Drug Treatment Services (NMDS-AODTS; mandated reporting commenced in July, 2000). This dataset shows that cannabis treatment seekers are typically male (70%) with a median age of 25 years. The cannabis treatments which are most commonly sought include counselling services (39%), information and assessment (22%), and withdrawal management (12%). These treatments are typically delivered in a non-residential facility setting (69%). The rates of individuals accessing these treatment services has increased over the last two decades in the US, Europe, and Australia.

The Treatment Episode Data Set (TEDS) reports on the demographic and substance use characteristics of individuals taken upon admission to primarily state funded treatment facilities in the US. This data shows that of all substance use treatment admissions, cannabis was the primary illicit drug of concern in 16% of admissions in 2003, which increased to 23.1% in 2009. The comparable Australian data from the NMDS-AODTS showed that 22% of substance use treatment entries were principally for
cannabis use in 2002-2003 which increased to a peak of 24.6% in 2005-2006, and reduced to 23.2% in 2009-2010.\textsuperscript{12, 302} Despite these overall increases in the use of cannabis treatment services, a significant proportion of individuals with cannabis use disorder do not access treatment for their concerns.

Data from the US National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) was utilised to illustrate the course of cannabis use disorder and treatment.\textsuperscript{11} Of those who had ever been diagnosed with cannabis abuse or dependence, few had ever sought treatment (9.8% and 34.7%, respectively).\textsuperscript{11} The small proportion of treatment seekers with a cannabis use disorder suggests that there are significant barriers that prevent many users from seeking cannabis treatment.\textsuperscript{305, 306}

**Barriers to seeking cannabis treatment**

Several studies on the barriers to substance use treatment have been conducted,\textsuperscript{305-318} although only a handful are specific to cannabis treatment.\textsuperscript{319-321} General substance use studies cite treatment barriers to include a lack of interest in, knowledge of, or motivation for treatment, a lack of treatment availability, extensive waiting periods, the expense of treatment, stringent treatment eligibility criteria, transport problems and a public stigma towards treatment.\textsuperscript{305-318} Perhaps the three greatest barriers, particularly for cannabis treatment, are a lack of the motivation needed to seek and complete treatment, not knowing where treatment can be sought and a feeling that accessing treatment will invoke stigma, especially when the available illicit drug treatment programs service injecting drug users.\textsuperscript{313, 318-322} Interestingly, these barriers parallel those cited to hinder mental health treatment seeking (such as “health literacy” and associated stigma),\textsuperscript{323} although those seeking mental health treatment more commonly
report additional concerns including the belief that nothing would help, and that treatment was too expensive or not covered by health plans.

In one of the few studies specific to cannabis, Ellingstad et al. interviewed 25 recently abstinent long-term daily cannabis users about their past substance use and barriers to treatment. Respondents reported that the most significant barrier to entering treatment was the belief that cannabis use was not enough of a problem or did not warrant treatment (80%). Other commonly reported barriers to cannabis treatment included wanting to quit without treatment (76%), or the stigma of being labelled a drug user (48%).

Gates et al. (the current candidate) conducted a larger study in order to represent the views of Australian regular cannabis users in treatment (CT; n=100), and those not in treatment (interviewed face-to-face [NT; n=100] and from an internet sample [IS; n=294]) to reach a more widespread sample from each Australian state and territory. The most commonly reported barrier was the feeling that treatment is not necessary to reduce cannabis use. This barrier was reported statistically significantly more frequently by those not in treatment compared to those in treatment (44% of NT, and 61% of IS, compared to 36% of CT) and by females compared to males (58% compared to 48%).

The next most commonly reported barrier was the opinion that cannabis users are not likely to be ready to stop their use. This barrier was mentioned statistically significantly more frequently by those in treatment compared to not in treatment (34% of CT compared to 14% of NT, and 23% of IS) and by participants aged 24-29 years compared to older age groups. Other commonly reported barriers included a lack of awareness of treatment options (14% of all participants) and a preference for avoiding the stigma.

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1 This study was conducted by the candidate and, as it was part of a body of research which identified the possible benefits of a telephone-based cannabis intervention, it is referenced in Appendix E.
associated with being labelled a drug user in need of treatment (12% of all participants).319

This study also reported on what cannabis users felt would facilitate entry into cannabis treatment. The most commonly reported facilitator was the improvement of available information regarding treatments (45% of NT, 25% of IS, and 32% of CT). Other reported facilitators included increasing the availability of cannabis specific services (16% of all participants), and introducing additional options such as telephone counselling (12% of all participants). These results were consistent with previous research regarding the factors influencing individuals to seek substance use treatment. That is, a study of 489 individuals reporting substance use problems found that those seeking treatment for cannabis use were statistically significantly more likely to report seeking treatment following hearing or seeing an advertisement regarding treatment than were individuals seeking cocaine or opioid treatment.318

An unmet need for cannabis treatment

Outpatient counselling services, the most common form of cannabis treatment sought in Australia, are generally delivered in a one-to-one, face-to-face fashion between counsellor and client.12 When concerned with efficiently reducing the public health burden attributed to cannabis use, a treatment service ideally would reach many individuals in need of services.326 Over the last two decades, this ideal has been hindered by a treatment system that has kept the focus on a one-to-one level, where the number of individuals reached is limited by the agency capacity and location.327, 328

Although the current prevalent model of one-to-one cannabis intervention may not reach treatment seekers beyond the limitations of agency capacity and location, these treatments show potential for reducing cannabis use and can inform future
developments of more successful interventions.\textsuperscript{299, 329} As such, an overview of the research regarding cannabis treatments is provided in the next chapter.
CHAPTER TWO: TREATMENTS FOR CANNABIS USE DISORDER

OVERVIEW

To date a total of 28 randomised controlled trials and six uncontrolled pilot studies have investigated the efficacy of various face-to-face interventions designed specifically to assist individuals in reducing their cannabis use. These interventions have been founded on the tenants of motivational interviewing (MI), motivational enhancement therapy (MET), cognitive behavioural therapy (CBT), different forms of family therapies, such as Multi-Dimensional Family Therapy (MDFT), acceptance and commitment therapy (ACT) and aversion therapy. Several review papers have discussed the literature on these cannabis interventions. In addition, a meta-analysis has been published investigating general substance use interventions which reported on cannabis use treatment outcomes that were specific to adolescents. This meta-analysis found that MDFT intervention approaches showed the greatest effect (Cohen’s $d > 0.8$) on cannabis use frequency. The more recent of the review articles on interventions specific to reducing cannabis use among adults consistently reported that interventions which combine both MET and CBT principals, and include abstinence-oriented contingency management (CM), have shown the greatest treatment outcomes (in terms of reductions in cannabis use frequency).

The results from many randomised controlled trials have shown that the use of pharmacotherapies in conjunction with tobacco and opioid substance use interventions can significantly increase treatment outcomes compared to these interventions alone.
It follows from these studies that the treatment outcomes from the combined MET+CBT+CM cannabis use interventions could be enhanced by the addition of pharmacotherapy. Unfortunately, empirical support for the use of pharmaceutical products in assisting cannabis reductions is mixed. To date, 13 trials of pharmaceutical cannabis use interventions have been conducted.\textsuperscript{377-389} The majority of these trials were designed to assist with the experience of cannabis withdrawal,\textsuperscript{377-384} with only a handful designed to directly assist with reducing cannabis use.\textsuperscript{385-389} Several review articles have been published on the use of pharmaceuticals to assist with cannabis use reduction.\textsuperscript{390-393} In these review articles, the use of oral THC is reported to have the greatest potential as a pharmaceutical intervention for cannabis use reduction, although this support is limited by a lack of large-scale clinical intervention trials including cannabis users with varied frequencies of use.

The interventions showing promise in assisting individuals to reduce cannabis use differ in terms of the counselling style, number of intervention sessions, and the duration of treatment and follow up, and in the measures of treatment outcomes employed. Because of this heterogeneity, no meta-analysis of interventions designed to specifically target cannabis use have been conducted.\textsuperscript{373} As such, the present chapter details each of the separate counselling styles that have been employed, and discusses the cannabis use intervention trials conducted over the last twenty years individually, before concluding with suggestions for future study and how the present thesis contributes to addressing research gaps.

**COUNSELING STYLES**

In general, cannabis use interventions are informed by the tenants of one or more counselling styles. In addition, cannabis interventions typically have been adapted from
previous application in other substance use treatment. Before describing the trials conducted to determine the efficacy of these cannabis use interventions, the counselling styles which provide the foundation to these interventions are briefly described here, including reference to their background in other substance use treatment.

**Motivational interviewing and motivational enhancement therapy**

Motivational interviewing (MI) is a style of counselling originated by Miller in 1983, and further developed by Miller and Rollnick in 1991. Like its practice, defining MI is not an easy task, but should refer to three core elements and four main principles. The three core elements are: 1) MI is a particular conversation about change, 2) MI is collaborative (person centred), and 3) MI is evocative (designed to attend to ambivalence and strengthen motivation to change). The four main principles in delivering MI are to: 1) express empathy, 2) support self-efficacy, 3) roll with resistance (do not challenge resistance), and 4) highlight discrepancy between where an individual is and where they want to be.

Motivational enhancement therapy (MET) is a variant of MI that has been utilised to apply the core elements and principals of MI to substance use treatment. The first variant of this kind, the *Brief Drinker Check-Up* model was designed in 1989 by Miller and Sovereign as an alcohol use intervention. The practitioners were tasked with eliciting a “taking stock” experience by providing feedback and education over two sessions to stimulate an informed choice to reduce alcohol use. In 1992 the *Check-Up* was converted to a manual guided brief treatment for substance use and renamed to motivational enhancement therapy (MET) by Miller et al. as part of a multisite clinical trial of alcohol treatment. MET interventions were thus made distinct from MI in that they included a feedback and education component.
To date, more than 200 clinical trials of MI-based substance use interventions have been published, and a recent Cochrane review has supported their efficacy in the short to medium term.\textsuperscript{397} That is, statistically significantly greater treatment outcomes were reported by participants receiving MI interventions compared to participants receiving no intervention in follow-up assessments of less than one year post-treatment.\textsuperscript{397}

**Cognitive behavioural therapy**

The practice of cognitive behavioural therapy (CBT) involves assisting individuals to recognise and manage (or avoid) any actions that lead to an unwanted behaviour by teaching management, coping and problem-solving skills.\textsuperscript{366} When applied to substance use treatment, in the event where an individual fails to avoid or manage substance use, a variant to CBT called relapse prevention also is typically utilised. Relapse prevention applies a greater focus to coping skills training and abstinence maintenance strategies compared to standard CBT, and is typically utilised later in an intervention.\textsuperscript{367} When applied to cannabis use treatment, a CBT perspective perceives cannabis use as a learned behaviour which is followed due to association with predictable outcomes (for example, an individual uses cannabis when they are stressed because they believe they feel less stressed when they use cannabis). Treatment providers therefore aim to provide exercises and practice assignments to assist in disrupting the connection between cannabis use and its controlling contingencies (such as by keeping a cannabis use diary and learning to challenge self-beliefs regarding cannabis use).\textsuperscript{398}

**Combination styles – Motivational enhancement and cognitive behavioural therapy**

The main tenants of MET and CBT already described are not mutually exclusive. That is, MET is suited for individuals who are contemplating reducing use, and CBT is
suitable for individuals who are in preparation or action phases.\textsuperscript{399, 400} As such, it is not unusual for these two counselling styles to be utilised in combination in substance use treatment.\textsuperscript{401} This combination typically begins with MET and moves in to CBT. In this way MET enhances and solidifies readiness to change, and CBT is delivered when the individuals are ready to make changes.\textsuperscript{402} Importantly, in delivering the combined intervention (MET+CBT) the counsellor must recognise that motivation is fleeting and be ready to again use MET if a participant’s motivation falters. In a review of 29 trials of substance use interventions which included an MI-based component, it was found that, when motivational sessions were combined with CBT-based sessions, treatment outcomes were greater than those based on the individual counselling styles.\textsuperscript{403}

**Family-based therapy**

Family-based therapies (FT) perceive that problem behaviours are likely to occur in response to problems within existing family relationships.\textsuperscript{404, 405} When applied to substance use treatment, FT involves a structured, skill-based intervention (including enhancing developmental tasks such as decision making and mastery and building on problem solving skills) to provide support and assistance to the family unit. As such, this includes the individuals looking to motivate a family member or friend to seek treatment as well as the substance user.\textsuperscript{172} Generally, FT interventions will coordinate a session such that the individual in need of treatment is confronted by the ways in which their substance use impacts on others around them.\textsuperscript{406} There are several forms of family-based therapies that have been applied to substance use, including functional family therapy,\textsuperscript{349} multidimensional family therapy,\textsuperscript{348, 368, 407} multisystemic therapy,\textsuperscript{408} family support network interventions,\textsuperscript{350} and brief strategic family dialectic therapy.\textsuperscript{409, 410} To date these family-based treatments, and particularly multidimensional family therapy
(MDFT) interventions, have been shown to be effective substance use interventions for dependent adolescents.\textsuperscript{411-414}

**Acceptance and commitment therapy**

Acceptance and commitment therapy (ACT) teaches individuals to accept and experience unwanted thoughts or behaviours (such as urges to use a substance) ‘in the moment’ and to take note of their properties (such as what triggers them, and how long they last) while not giving in to them (using a substance).\textsuperscript{369} In doing so, the negative or aversive properties of these thoughts or behaviours have been empirically shown to reduce, such that experiencing them becomes easier and the distance between the thought and the evoked behaviour increases which weakens the functional relation between the two.\textsuperscript{415,416,417,418} This process has been labelled cognitive defusion. ACT also teaches individuals to begin linking the experience of these thoughts with personally identified reinforcers or goals (such as the wish to live an abstinent lifestyle) and to make a commitment to achieving them.\textsuperscript{419} In the last decade preliminary trials have supported the use of ACT in assisting individuals to reduce opiate use,\textsuperscript{420} and tobacco smoking.\textsuperscript{420}

**Aversion therapy**

Aversion therapy is a form of treatment which gained popularity in the 1960s to 1980s to promote the reduction of undesirable behaviours (particularly those which are repetitive or ritualistic in nature) by the repeated pairing of these behaviours with noxious stimulation.\textsuperscript{370} In doing so the participant associates the use of a drug with the presentation of a noxious stimulation, with the intention of learning to reduce drug use.\textsuperscript{421} This form of therapy has been utilised in several pilot and uncontrolled studies as the basis of treatment for alcohol,\textsuperscript{422-424} tobacco,\textsuperscript{425} heroin,\textsuperscript{426} and cocaine
dependence. Unfortunately, due to the unpleasant nature of aversion therapy, and in combination with the lack of controlled trials, the availability of this form of treatment is limited and currently suffers from a lack of public acceptability. This attitude is in spite of research findings where the successes of the treatment in substance use outweigh the minimal discomfort involved for participants.

**Contingency management**

Although not a counselling style *per se*, contingency management (CM) is sometimes used as an additional supportive component to behavioural interventions. When applied to substance use treatment, CM refers to the provision of an incentive (typically vouchers) for the provision of biological samples that are tested negative for substance use, or for adhering to treatment appointments, and withholding incentive when the samples test positive, or for treatment absences. CM initially was trialled in substance use treatment in the 1990s as an addition to behavioural counselling treatments for cocaine users from several different populations. Since this time, CM approaches have become one of the most thoroughly researched and effective behavioural procedures to achieve treatment targets in substance use interventions.

**CANNABIS USE INTERVENTIONS**

This section outlines the 32 cannabis use intervention trials that have been conducted over the past two decades. These trials are categorised according to the counselling style(s) to which the associated interventions are based on. A brief summary of the more notable of these trials (based on length of follow-up and any original contributions to the field) is provided here. In addition, all trials are depicted in the relevant tables at the end of each section. Three tables are included to detail 1) the participants and measures used in the trials, 2) any significant between-group differences that are reported by the
trials and the treatment effect size relating to changes in frequency of cannabis use, and
3) the percentage of cannabis using days and the percentage of participants reporting
abstinence at each follow-up assessment (depicted as short, medium, and long term
follow-up to represent follow-up periods of one to four months, five to 11 months, and
12 or more months, respectively).

**Cannabis use interventions based on motivational interviewing**

To date 12 MI-based cannabis use interventions have been investigated.\(^{331, 334, 336, 339, 340, 343, 344, 346, 347, 351, 360, 362}\) The first randomised controlled trial of an MI-based cannabis use intervention was conducted by Stephens et al. in 2000 in the US.\(^{343}\) In this initial study, following screening, 291 participants (77% male, with a mean age of 34 years) were randomly allocated to receive either: 1) two 90-minute individual sessions of an MI-based intervention delivered one month apart (with the second session allowing for a supportive friend/relative to attend if desired; \(n=88\)); or 2) 14 two-hour group sessions of an intervention based on relapse prevention delivered over 18 weeks (with the option for a supportive friend/relative to attend four of these sessions; \(n=117\)); or 3) a delayed-treatment control group (\(n=86\)). Comparisons between intervention and control groups were made in this initial study over 4 months and between the two interventions over 16 months (12% lost to follow-up), with a supportive friend/relative providing collateral verification to participant self-report in both intervention conditions (85% of self-reported use was verified, with an agreement in 73% of cases).

Both intervention groups showed statistically equivalent gains over control in participant cannabis use reductions and related problems at 16 months even when considering only those participants who completed the interventions (with 29% of the MI group and 28% of the relapse prevention group reporting abstinence from cannabis
at 16 months). Thus, the authors’ hypothesis that the more intensive relapse prevention condition would achieve significantly greater treatment gains was not supported, indicating that the extra resources allocated to this intervention were not required. Notably, the impact of delivering the relapse prevention intervention in an individual format as compared to a group basis could not be determined by this trial and may have tempered the expected benefit of this intervention.

Following this initial trial, Stephens et al. developed the MET based “Marijuana Check-up” (MCU; adapted from the aforementioned Drinkers Check-up model\(^3^{96}\)) in 2004,\(^4^{38}\) and evaluated its efficacy in 2007.\(^3^{44}\) Post screening, 188 participants were recruited (75% male, with a mean age of 32 years) over six months and were randomly allocated to one of three groups: 1) the MCU intervention (one 90-minute session with personalised feedback on cannabis use and consequences; \(n=62\)), 2) a multimedia feedback group (MMF; an initial 90-minute individual session, then a 25 minute documentary on recent cannabis research, then a slide presentation on the effects of cannabis use with commentary by researchers; \(n=62\)), or 3) a delayed treatment control (DTC; \(n=64\)).\(^3^{44}\) Follow up data was collected at 6 weeks from baseline (for intervention and control groups), with follow-up assessments conducted at 6 and 12 months (for intervention participants, with 17% of participants lost to follow-up).

The participants were asked to report on their cannabis use frequency and quantity, severity of dependence, and related problems, with urinalysis validating self-report of cannabis use.\(^3^{44}\) Compared to the MMF and DTC groups at 7-week follow-up, participants allocated to the MCU reported statistically significantly fewer symptoms of cannabis dependence (2.4 symptoms compared to 2.9 in the MMF and DTC groups), fewer days of use per week (4.7 days compared to 5.4 and 5.8), and less smokes per day
(1.7 smokes compared to 1.9 and 2.2), but reported a similar number of cannabis-related problems (3.7 problems compared to 5.0 in both groups). These significant treatment outcomes were sustained to the 12-month follow-up with the exception of the number of smokes per day. This trial, and the initial investigation of a MI-based intervention,\cite{343} represent the only two cannabis use interventions based on the principals of MI to report statistically significant treatment outcomes in the longer term (12 months).

Unfortunately, these studies did not report if these treatment outcomes were clinically meaningful.

In total, seven studies of MI-based interventions have been conducted to determine their efficacy with adolescents.\cite{331,334,339,346,347,360,362} From this evidence base, the majority of trials have supported the use of these interventions in assisting adolescents to reduce cannabis use in the short term.\cite{331,334,346,360,362} However, only four trials have included a follow-up assessment beyond three months.\cite{331,339,362}

The first of these trials was an uncontrolled investigation of a four session Check-up style intervention conducted weekly.\cite{362} This trial showed that intervention participants reported a statistically significantly reduced number of cannabis using days and symptoms of dependency at three and six month follow-up compared to baseline.\cite{362}

A second trial followed three years later which compared a single-session MI-based intervention to a condition controlling for the effects of counsellor attention and advice giving on the effects of drugs.\cite{339} This trial showed that both conditions engendered a reduction in cannabis use at three and six month follow-up, although there was no statistically significant difference between conditions in the reductions reported.

Notably, the trial authors later reported that poor practitioner fidelity partially explained a lack of treatment effect at three months.\cite{439} That is, the accurate expression of the MI
spirit (a global measure of the main MI elements and principals) and use of complex reflections (both measured using the Motivational Interviewing Treatment Integrity scale) were each associated with cannabis cessation at three months. Unfortunately, the authors did not report whether those intervention participants who received a counsellor whom expressed MI spirit and utilised complex reflections reported statistically significantly greater reductions than control.439

Recognising that previous MI studies mainly recruited males, the most recent randomised controlled trial of an MI-based cannabis treatment targeted a female only population.340 Stein et al. recruited 332 adult females from newspaper advertisements (mean age of 21 years, ranging from 18 to 23 years) and randomly allocated them to receive either: 1) two sessions of brief MI lasting approximately 45 minutes delivered one month apart \((n=163)\); or 2) a control group receiving a brief assessment only \((n=169)\). Follow up data were collected at one, three, and six months post treatment by self-report (attrition rates were reported at six months only, with 21% loss to follow-up). Participants in the MI group reported statistically significantly greater reductions in cannabis use frequency (but not problems associated with use) compared to control by three months (that is, not at one month follow up). A statistically significant treatment effect was noted at six month follow-up only among those who reported a desire to quit at baseline.

The only adolescent trial to include a long term (12-month) follow-up assessment of a cannabis use intervention was conducted recently in the US.331 These authors recruited participants \((n=310, 61\% \text{ male, with a mean age of 16 years})\) by delivering over 300 presentations in school classrooms offering students who reported using cannabis at least weekly a place in the trial. Participants were randomly allocated to receive, either:
1) a two session intervention based on the Check-up model with the additional option of attending two sessions of CBT-based skills training (n=103; referred to as MET), 2) a two session intervention based on educating participants about the effects of drug use with the same additional CBT-based sessions (n=102; referred to as the educative feedback control condition, or EFC), or 3) a three month delayed treatment control (n=105; referred to as the delayed feedback control, or DFC). Notably, few participants actually utilised the optional CBT sessions (13% used at least one session). Follow-up assessments were conducted at three months post baseline for all conditions and at 12-months for the intervention conditions (loss to follow-up at twelve months was 9%). At the three month assessment participants receiving the MET intervention reported a greater reduction in cannabis use frequency, severity of dependence and related problems compared to the DFC condition. Those receiving the EFC intervention also reported greater reductions in severity of dependence and related problems compared to the DFC condition (although the between-group difference in frequency of cannabis use did not reach statistical significance). Both intervention conditions maintained these reductions in cannabis use and related problems to 12-month follow-up with no statistically significant between-group differences. Neither intervention condition, nor the DFC condition, engendered any statistically significant reductions in alcohol or other drug use. As such, this trial supported the efficacy of a MET intervention targeting adolescents’ cannabis use although this trial also suggested that comparable treatment outcomes could be engendered by simple education on drug effects.

A comment on MI-based cannabis use interventions

To summarise, MI-based cannabis use interventions have shown some promise in assisting cannabis users to reduce cannabis use in four main ways. First, two initial pre-
test, post-test style trials have demonstrated that Check-up style interventions engender statistically significant reductions in cannabis use in the short term (three month follow-up) with a small to medium treatment effect size.\textsuperscript{360,362} Second, those trials conducted to compare MI-based cannabis use interventions to no intervention control conditions have supported their efficacy in the short term (also showing small to medium treatment effect sizes on cannabis use reductions),\textsuperscript{336,340,343,346} although this support is not entirely consistent.\textsuperscript{339,347} Third, those trials conducted to compare MI-based cannabis use interventions to alternative treatment comparison groups typically favour the MI-based interventions (showing small to large treatment effect sizes on cannabis use reductions),\textsuperscript{334,336,344} although two trials have failed to show a statistically significant difference in changes to cannabis use between conditions.\textsuperscript{339,343} Fourth, MI-based interventions are favourable in that their delivery does not require significant resources. That is, the intensity and duration of the intervention is low (the majority of MI-based cannabis use interventions consisted of one or two one-hour sessions). Further, a single trial investigating the utility of supplementing an MI-based intervention with attendance-based contingency management found that this additional expense did not statistically significantly increase treatment outcomes compared to the intervention alone.\textsuperscript{351}

Support for MI-based interventions is tempered by four important factors. First, the evidence base behind these interventions is contingent on participant samples that are either adolescents (typically a mean of 16 years) or young adults (between 21 and 34 years on average), and participants are mostly male (typically more than 70\%). Thus, the efficacy of MI-based interventions among older or female populations is not yet well established. Second, the mechanisms underlying treatment efficacy remain uncertain due to a lack of measurement of what might predict treatment outcomes.\textsuperscript{403,440}
A single study has reported that the efficacy of MI-based interventions may be improved by ensuring the accurate expression of MI-spirit and the appropriate use of complex reflections. Further research focussed on factors relating to participant characteristics and has shown that increased participant readiness to change, and self-efficacy at baseline predicted improved treatment outcomes, although not consistently. Third, the importance of treatment fidelity has only recently been recognised, and some studies have shown that different practitioners can produce better outcomes than others. It follows that the lack of significance in treatment outcomes post three months often observed in MI-based cannabis use interventions here, and in other substance use MI-based interventions elsewhere, could be partially explained by poorly trained practitioners - a factor rarely controlled for in MI research. Alternatively, some people may just be more responsive to treatment, such as those with less problematic personality traits, or those with a good ability to establish stable mutual relationships, and to verbalize and cooperate. Finally, although only four trials of MI-based cannabis interventions have included a measure of psychological functioning, to date no MI-based cannabis intervention has engendered a statistically significant treatment effect on this outcome.
Table 2.1 Motivational interviewing interventions for cannabis use – participants, measures, and loss to follow-up

<table>
<thead>
<tr>
<th>Articles</th>
<th>Participants</th>
<th>Cannabis use</th>
<th>Dependence severity</th>
<th>Related problems</th>
<th>Well-being</th>
<th>Self-motivation to reduce use</th>
<th>Other drug use</th>
<th>Meaningful improvement</th>
<th>Attrition (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephens et al. (2000)(^{243})</td>
<td>77 34 yrs</td>
<td>90-day self-report</td>
<td>DSM-III-R</td>
<td>MPS</td>
<td>-</td>
<td>-</td>
<td>90-day any drug</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Sinha et al. (2003)(^{351})</td>
<td>92 21 yrs</td>
<td>28-day TLFB</td>
<td>ASI</td>
<td>ASI</td>
<td>-</td>
<td>-</td>
<td>SOCRATES</td>
<td>ASI</td>
<td>11</td>
</tr>
<tr>
<td>Martin et al. (2005)(^{362, 444})</td>
<td>77 16 yrs</td>
<td>90-day Self-report</td>
<td>DSM-IV (SCID), SDS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>63</td>
</tr>
<tr>
<td>Walker et al. (2006)(^{347})</td>
<td>48 16 yrs</td>
<td>GAIN-I</td>
<td>GAIN-I</td>
<td>-</td>
<td>-</td>
<td>Collected, not reported</td>
<td>GAIN-I</td>
<td>50% reduction @ 3 mos. or no CUD symptoms</td>
<td>9</td>
</tr>
<tr>
<td>Berguis et al. (2006)(^{360})</td>
<td>72 15 yrs (^a)</td>
<td>90-day Self-report (^b)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0 (^a)</td>
</tr>
<tr>
<td></td>
<td>77 16 yrs (^b)</td>
<td>90-day Self-report (^b)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>26 (^b)</td>
</tr>
<tr>
<td>Stephens et al. (2007)(^{344})</td>
<td>75 32 yrs</td>
<td>90-day TLFB</td>
<td>DSM-IV (SCID)</td>
<td>MPS</td>
<td>-</td>
<td>-</td>
<td>19-item scale, RTC</td>
<td>-</td>
<td>17</td>
</tr>
<tr>
<td>Martin et al. (2008)(^{346})</td>
<td>67 17 yrs</td>
<td>90-day TLFB</td>
<td>GAIN-I, SDS</td>
<td>-</td>
<td>-</td>
<td>Stage of change</td>
<td>-</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>McCambridge et al. (2008)(^{39})</td>
<td>69 18 yrs</td>
<td>30-day Self-report</td>
<td>SDS</td>
<td>CPQ</td>
<td>-</td>
<td>-</td>
<td>AUDIT, Fagerstrom</td>
<td>-</td>
<td>29</td>
</tr>
<tr>
<td>Articles</td>
<td>Participants</td>
<td>Measures of Treatment Outcomes</td>
<td>Attrition (%)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
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</tr>
<tr>
<td>D’Amico et al. (2008)</td>
<td>48 16 yrs</td>
<td>A/YAPS, Likert scale on peer influence, and related problems</td>
<td>30</td>
<td></td>
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<tr>
<td>Bonsack et al. (2011)</td>
<td>87 25 yrs</td>
<td>7-day TLFB, 30-day CSUAS, CSSRI</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stein et al. (2011)</td>
<td>0 21 yrs</td>
<td>90-day TLFB (SCID), MPS</td>
<td>21</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Walker et al. (2011)</td>
<td>61 16 yrs</td>
<td>60 day GAIN, MPI</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

* ‘Attrition’ refers to the loss to follow-up at final assessment. As some authors presented percentages without decimal points, those articles providing data with decimal points were rounded to maintain consistency across studies.

a This article reported two trials conducted in two cites, this data refers to the US sample.
b This article reported two trials conducted in two cites, this data refers to the Australian sample.

Table 2.2 Motivational interviewing interventions for cannabis use – treatment condition comparisons

<table>
<thead>
<tr>
<th>Articles</th>
<th>Between-group comparison</th>
<th>Included measures</th>
<th>Condition with significantly greater outcome and the measures showing a significant between-condition difference</th>
<th>Treatment effect size d (95% CI) at final FU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number of sessions : condition [1] (N) compared to [2] (N)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephens et al. (2000)</td>
<td>2-MI (88)</td>
<td>DTC (86)</td>
<td>a,b,c,d,g</td>
<td>1.0 (0.7 - 1.3)</td>
</tr>
<tr>
<td></td>
<td>14-RPSG (117)</td>
<td>DTC (86)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-MI (88)</td>
<td>14-RPSG (117)</td>
<td>[1] a,b</td>
<td>1.3 (1.0 - 1.6)</td>
</tr>
<tr>
<td>Sinha et al. (2003)</td>
<td>3-MET (28)</td>
<td>3-MET+CM (37)</td>
<td>a,c,e</td>
<td>0.2 (-0.1 - 0.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ns</td>
<td>0.3 (-0.2 - 0.8)</td>
</tr>
<tr>
<td>Martin et al. (2005)</td>
<td>4-ACCU (73)</td>
<td>Baseline data</td>
<td>a,b,c</td>
<td>0.4 (0.1 - 0.8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,b,c</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,c</td>
<td></td>
</tr>
<tr>
<td>Walker et al. (2006)</td>
<td>2-MET (47)</td>
<td>DTC (50)</td>
<td>a,c,e,f,g</td>
<td>0.2 (-0.2 - 0.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Berguis et al. (2006)</td>
<td>1-MCU (US sample)</td>
<td>Baseline data</td>
<td>a</td>
<td>0.2 (-0.2 - 0.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>0.4 (0.1 - 0.8)</td>
</tr>
<tr>
<td></td>
<td>1-MCU (Australian sample)</td>
<td>Baseline data</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Stephens et al. (2007)</td>
<td>1-MCU (62)</td>
<td>DTC (64)</td>
<td>a,b,c,d</td>
<td>0.2 (-0.2 - 0.6)</td>
</tr>
<tr>
<td></td>
<td>1-MMF (62)</td>
<td>DTC (64)</td>
<td>[1] a,b,c</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-MCU (62)</td>
<td>1-MMF (62)</td>
<td>ns</td>
<td>3.5 (3.0 - 4.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,b,c</td>
<td>3.3 (2.8 - 3.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,b,c</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,c</td>
<td></td>
</tr>
<tr>
<td>Martin et al. (2008)</td>
<td>2-ACCU (20)</td>
<td>DTC (20)</td>
<td>[1] a,b,c</td>
<td>0.6 (-0.0 - 1.2)</td>
</tr>
<tr>
<td>D'Amico et al. (2008)</td>
<td>1-MI (38)</td>
<td>TAU (26)</td>
<td>a,b,d,g</td>
<td>0.8 (0.3 - 2.0)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,b,d,g</td>
<td></td>
</tr>
<tr>
<td>McCambridge et al. (2008)</td>
<td>1-MI (164)</td>
<td>1-TAC (162)</td>
<td>a,b,c,d,g</td>
<td>0.0 (-0.2 - 0.2)</td>
</tr>
<tr>
<td>Bonsack et al. (2011)</td>
<td>4-6-MI+TAU (30)</td>
<td>TAU (32)</td>
<td>a,b,c,d,e</td>
<td>0.4**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,b</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a,b</td>
<td></td>
</tr>
</tbody>
</table>

* significant difference
** moderate difference
Table 2.2 (Cont.) Motivational interviewing interventions for cannabis use – between-condition comparisons in treatment outcomes

<table>
<thead>
<tr>
<th>Articles</th>
<th>Between-group comparison</th>
<th>Included measures</th>
<th>Condition with significantly greater outcome and the measures showing a significant between-condition difference</th>
<th>Treatment effect size d (95% CI) at final FU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number of sessions : condition [1] (N) compared to [2] (N)</td>
<td>Treatment end</td>
<td>Short FU</td>
<td>Medium FU</td>
</tr>
<tr>
<td>Stein et al. (2011)</td>
<td>2:MI (162) 1:TAC (169)</td>
<td>a,b,c,d</td>
<td>ns</td>
<td>[1] a</td>
</tr>
<tr>
<td>Walker et al. (2011)^101</td>
<td>2:MET+4CBT^ (103)</td>
<td>a,c,d,g</td>
<td>-</td>
<td>[1] a,c,d</td>
</tr>
<tr>
<td></td>
<td>2:EFC+4CBT^ (102)</td>
<td>a,c,d</td>
<td>-</td>
<td>[1] c,d</td>
</tr>
<tr>
<td></td>
<td>2:MET+4CBT^ (103)</td>
<td>a,c,d,g</td>
<td>-</td>
<td>ns</td>
</tr>
</tbody>
</table>

Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “■” symbol is used in the case where an article did not include a follow-up assessment within one of these periods. The condition which achieved the more positive treatment outcome (for example, a greater reduction in cannabis use or improvement in well-being) is presented in square brackets (either [1], or [2]) along with the symbols for each measure (a through to g) where a statistically significant between-condition difference was noted. If no significant between-condition difference was noted at p < 0.05 on any included measure, “ns” denotes the non-significance. Unless otherwise stated, the treatment effect sizes were based on change in days of cannabis use (mean and standard deviation) from baseline to final follow-up.

* This effect size was provided by D’Amico et al. ** Bonsack et al. provided this effect size without a confidence interval or adequate data to calculate this interval. *** Stein et al. provided an odds ratio giving the effect on the odds of using cannabis on a particular day.


^ These CBT sessions were optional and not well utilised (a maximum of 13% of participants used any of four optional sessions). As such, this intervention was considered to be chiefly MET-based.

Treatment Outcomes “a” cannabis using days, “b” quantity per day, “c” cannabis dependence severity, “d” cannabis-related problems, “e” psychological well-being, “f” meaningful change, “g” other drug use.
Table 2.3 Motivational interviewing interventions for cannabis use – cannabis use outcomes

<table>
<thead>
<tr>
<th>Articles</th>
<th>Treatment number of sessions : intervention (N)</th>
<th>Collateral Measures used to check fidelity</th>
<th>A = Days of use (%)</th>
<th>B = Point-prevalence abstinence (%)</th>
<th>Short FU</th>
<th>Medium FU</th>
<th>Long FU</th>
<th>Significant predictors of cannabis use frequency at final follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephens et al. (2000)</td>
<td>2:MI (88)</td>
<td>Supportive friend/family</td>
<td>Participant satisfaction</td>
<td>-</td>
<td>-</td>
<td>26*</td>
<td>39</td>
<td>28*</td>
</tr>
<tr>
<td></td>
<td>14:RPSG (117)</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>23*</td>
<td>44</td>
<td>30*</td>
</tr>
<tr>
<td></td>
<td>DTC (86)</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>57*</td>
<td>17</td>
<td>-</td>
</tr>
<tr>
<td>Sinha et al. (2003)</td>
<td>3:MET (28)</td>
<td>Urine</td>
<td>None</td>
<td>20*</td>
<td>?</td>
<td>28*</td>
<td>?</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3:MET+CM (37)</td>
<td></td>
<td></td>
<td>37*</td>
<td>?</td>
<td>35*</td>
<td>?</td>
<td>-</td>
</tr>
<tr>
<td>Martin et al. (2005)</td>
<td>4:ACCU (73)</td>
<td>Urine</td>
<td>Participant satisfaction</td>
<td>-</td>
<td>-</td>
<td>17</td>
<td>?</td>
<td>16</td>
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<tr>
<td>Berguis et al. (2006)</td>
<td>1:MCU, US sample (54)</td>
<td>None</td>
<td>Participant satisfaction</td>
<td>-</td>
<td>-</td>
<td>28*</td>
<td>15</td>
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<tr>
<td></td>
<td>1:MCU, Australian sample (73)</td>
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<td>-</td>
<td>-</td>
<td>47*</td>
<td>17</td>
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<tr>
<td>Walker et al. (2006)</td>
<td>2:MET (47)</td>
<td>DTC (50)</td>
<td>None</td>
<td>Session recording &amp; feedback</td>
<td>-</td>
<td>-</td>
<td>52*</td>
<td>?</td>
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<tr>
<td>Stephens et al. (2007)</td>
<td>1:MCU (188)</td>
<td>Urine</td>
<td>Session recording &amp; feedback</td>
<td>-</td>
<td>-</td>
<td>32*</td>
<td>?</td>
<td>30*</td>
</tr>
<tr>
<td></td>
<td>1:MMF (62)</td>
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<td></td>
<td>-</td>
<td>-</td>
<td>22*</td>
<td>?</td>
<td>25*</td>
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<td>DTC (64)</td>
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<td>-</td>
<td>-</td>
<td>18*</td>
<td>?</td>
<td>-</td>
</tr>
<tr>
<td>Martin et al. (2008)</td>
<td>2:ACCU (20)</td>
<td>Urine</td>
<td>Participant satisfaction</td>
<td>-</td>
<td>-</td>
<td>40</td>
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<td>DTC (20)</td>
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<td>39</td>
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<tr>
<td>McComb et al. (2008)</td>
<td>1:MI (164)</td>
<td>None</td>
<td>Session recording &amp; feedback</td>
<td>-</td>
<td>-</td>
<td>49*</td>
<td>21</td>
<td>46*</td>
</tr>
<tr>
<td></td>
<td>1:TAC (162)</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>53*</td>
<td>16</td>
<td>48*</td>
</tr>
<tr>
<td>D’Amico et al. (2008)</td>
<td>1:MI (36)</td>
<td>None</td>
<td>Session recording &amp; feedback</td>
<td>-</td>
<td>-</td>
<td>48*5</td>
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<td>TAU (24)</td>
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<td>-</td>
<td>-</td>
<td>63*5</td>
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</tr>
</tbody>
</table>
Table 2.3 (Cont.) Motivational interviewing interventions for cannabis use – cannabis use outcomes

<table>
<thead>
<tr>
<th>Articles</th>
<th>Treatment number of sessions : intervention (N)</th>
<th>Collateral Measures used to check fidelity</th>
<th>A = Days of use (%)</th>
<th>B = Point-prevalence abstinence (%)</th>
<th>Significant predictors of cannabis use frequency at final follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonsack et al. (2011)^336</td>
<td>4-6-MI+TAU (30) TAU (32)</td>
<td>None</td>
<td>-</td>
<td>? ?</td>
<td>-</td>
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<tr>
<td>Stein et al. (2011)^440</td>
<td>2-MI (163)</td>
<td>None</td>
<td>Session recording &amp; feedback</td>
<td>? ?</td>
<td>33?</td>
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<td>1-TAC (169)</td>
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<td>46?</td>
</tr>
<tr>
<td>Walker et al. (2011)^331</td>
<td>2-MET+4CBT¥ (103)</td>
<td>None</td>
<td>Session recording &amp; feedback</td>
<td>-</td>
<td>53¥</td>
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<tr>
<td></td>
<td>2-EFC+4CBT¥ (102)</td>
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<td>58¥</td>
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<tr>
<td></td>
<td>DTC (105)</td>
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<td></td>
<td></td>
<td>62¥</td>
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</tbody>
</table>

Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “-” symbol is used in the case where an article did not include a follow-up assessment within one of these periods. The “?” symbol is used to denote those cases where the required data was not reported by the article. As some authors presented percentages without decimal points, all data is presented with decimal points rounded to maintain consistency across studies.

^ Unless otherwise specified, the percentage of cannabis using days refers to the past 90 days; * per cent abstinent days in past month; ^ per cent abstinent days in past week; ¥ per cent abstinent days in past 60 days

^ This figure was provided by graph in the relevant article and so was estimated for the purposes of this table


¥ These CBT sessions were optional and not well utilised (a maximum of 13% of participants used any of four optional sessions). As such, this intervention was considered to be chiefly MET-based
Cannabis use interventions based on cognitive behavioural therapy

To date five trials of CBT-based cannabis use interventions have been investigated. In the first trial of a CBT-based cannabis use intervention, Stephens et al. investigated a relapse prevention treatment which included active problem-focused counselling designed to enhance coping skills, self-monitoring and self-rewarding. Participants were 212 adults (75.9% male, with a mean age of 32 years) recruited through media advertisements and randomly allocated to receive either: 1) 10 two-hour CBT group sessions (12-15 participants per session) delivered over 12 weeks with two booster sessions at three and six months \((n=80)\), or 2) 10 two-hour social support group sessions with 12-15 participants per session (SSP; practitioners avoided direct input while assisting in discussions regarding the giving and receiving of social support when attempting to reduce cannabis use) also delivered over 12 weeks with two booster support group sessions \((n=87)\). Follow up data was collected on five occasions across 12 months from baseline (21% of participants were lost to follow-up), with a concerned family member or friend providing collateral validation for 96% of participants by mail questionnaire.

A reduction of 50% in cannabis use frequency from baseline levels combined with no report of any cannabis-related problems at three, six, and 12 months was defined as clinically meaningful improvement. Overall, both intervention groups showed statistically equivalent treatment gains with 31% of participants considered clinically improved throughout the follow-up period. One notable exception was that males in the CBT-based intervention showed greater rates of improvement compared to the SSP condition at the three month follow-up (29% compared to 8%), although females did not (27% compared to 30%). As this was an initial trial of a CBT-based intervention
for cannabis use and did not include an unassisted control group, the efficacy of
treatment over rates of unassisted recovery could not be determined.

A second trial of a CBT-based intervention was conducted by Lang et al. in 2000.\(^{330}\) Although this trial did not include a control group, it presented an initial pre- and post-
test investigation of a CBT-based intervention which incorporated a strong focus on
developing the therapeutic relationship between the counsellor and the participants. A
total of 61 participants were recruited into the trial, and post screening, 30 participants
attended the intervention (63% males, with a mean age of 29 years). The participants
reported statistically significant reductions in cannabis use frequency and quantity as
well as other substance use and a “positive change” in health and social problems
(reported in a qualitative discussion) at one and three month follow-up. As such, the
authors proposed that additional study including a control group was warranted to
determine whether the positive changes reported were associated with treatment and
were not a result of non-treatment factors such as motivation to reduce.

Recognising the need for a control group, Stephens et al. conducted a second large
randomised controlled trial of a CBT-based cannabis treatment in 2000.\(^{343}\) As already
described, this trial included treatment outcome comparisons with a two session MI-
based intervention and a delayed treatment control condition, in addition to a 14-session
relapse prevention intervention. Both intervention groups reported greater treatment
gains regarding cannabis use, dependence, or related problems compared to the control
condition. Notably, no statistically significant differences in these treatment gains were
reported between the intervention groups over 16 months.\(^{343}\)

Recognising the potential of a brief CBT based cannabis treatment, Copeland et al.\(^{342}\)
contributed to the evidence base by providing a trial with a delayed treatment control
group and included treatments of differing length. The authors recruited 510 adult participants from newspaper advertisement and, post screening, randomly allocated 229 participants (69.4% male, with a mean age of 32 years) to receive either: 1) a single 90 minute CBT-based session (n=82); 2) six weekly one-hour CBT-based sessions (n=78); or 3) a delayed treatment control group (n=69). Follow up data was collected at a median of eight months (reported as a median of 237 days with a range of 102 to 553 days) post treatment for three quarters of the sample (74.2%), with urinalysis validating self-report. At follow up, both treatment conditions reported statistically equivalent reductions in cannabis use compared to control (rates of abstinence in the month prior to follow up were 20.8% in six sessions, and 17.2% in 1 session, and 3.6% in control group). Notably, participants of the six session intervention reported statistically significantly reduced cannabis dependence severity compared to the single session intervention. Thus, this early study of CBT suggested that allocating resources to an intensive six session CBT intervention may significantly reduce severity of cannabis dependence, but not frequency of cannabis use, in comparison to a single session intervention.

The most recent trial of a CBT-based intervention assessed the utility of including contingency management (CM) and was conducted by Budney et al. These authors recruited 90 adults with a cannabis use disorder (CUD) from advertisements indicating the availability of an outpatient treatment. Participants (77% male, with a mean age of 33 years) were randomly allocated to receive either: 1) CM with a self-help manual only (n=30; based on the provision of cannabis-negative urine samples, participants could earn up to $140 in vouchers after receiving vouchers of increasing worth with continuous cannabis-negative samples); 2) 14 weekly 50 minute long CBT based sessions (n=30); or 3) the CBT condition coupled with the CM (n=30). Follow-up
data was collected monthly over 12 months for 74% of participants, with urinalysis validation of self-report collected every three months.

Unlike the trial regarding the addition of CM to a MI-based intervention, the CBT+CM condition produced statistically greater rates of abstinence during treatment compared to the CBT condition alone, and the CM condition alone (44% compared to 28% and 27%). Despite this, no statistically significant difference was reported regarding reductions in cannabis use between treatment groups at post-treatment follow-up assessments. Thus, this trial suggests that in this instance it was not required to expend additional resources on CBT when equivalent long term outcomes were gained by CM alone.

A comment on CBT-based cannabis use interventions

As with the trials of MI-based interventions, these initial trials suggest that even a single session of a CBT-based intervention is capable of producing reductions in cannabis use that are greater than a delayed treatment control. Although Stephens et al. showed that just two sessions of an MET-based intervention could produce statistically equivalent treatment gains to 14 sessions of a CBT-based intervention, no trial has demonstrated statistically greater treatment outcomes by utilising one style of counselling over the other. Further, as shown in Table 2.5, the reported CBT-based treatment effect sizes on cannabis use reductions are small to moderate. In recognition of this, further study on CBT- and MET-based interventions hypothesised that the combination of the two counselling styles may afford greater treatment outcomes than either style on its own.
Table 2.4 Cognitive behavioural cannabis use interventions – Participants, measures, and loss to follow up

<table>
<thead>
<tr>
<th>Articles</th>
<th>Participants</th>
<th>Cannabis use</th>
<th>Dependence</th>
<th>Measures of Treatment Outcomes</th>
<th>Other drug use</th>
<th>Meaningful improvement</th>
<th>Attrition (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephens et al. (1994)</td>
<td>76</td>
<td>32 yrs</td>
<td>90-day Self-report</td>
<td>20-item DAST MCQ - - 90-day any drug Abstinence OR 50% reduction and no CUD problems</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lang, et al. (2000)</td>
<td>63</td>
<td>29 yrs</td>
<td>7-day self-report</td>
<td>- Qualitative discussion Qualitative discussion - 7-day self-report - -</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephens et al. (2000)</td>
<td>77</td>
<td>34 yrs</td>
<td>90-day Self-report</td>
<td>DSM-III-R MPS - - 90-day any drug - -</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copeland et al. (2001)</td>
<td>69</td>
<td>32 yrs</td>
<td>OTI, 90-day Self-report</td>
<td>DSM-IV (SCID), SDS CPQ GSI, BDI - - - -</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budney et al. (2006)</td>
<td>77</td>
<td>33 yrs</td>
<td>30-day TLFB</td>
<td>ASI MPS, ASI.BSI GSI, BDI - ASI -</td>
<td>26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Attrition refers to the loss to follow-up at final assessment. As some authors presented percentages without decimal points, those articles providing data with decimal points were rounded to maintain consistency across studies.

Table 2.5 Cognitive behavioural therapy cannabis use interventions – Treatment condition comparisons

<table>
<thead>
<tr>
<th>Articles</th>
<th>Between-group comparison</th>
<th>Included measures</th>
<th>Condition with significantly greater outcome and the measures showing a significant between-condition difference</th>
<th>Treatment effect size d (95% CI) at final FU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number of sessions : condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] (N) compared to [2] (N)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephens et al. (1994)360</td>
<td>10:RP (106)</td>
<td>a,d,f,g</td>
<td>ns</td>
<td>[1] f (men only)</td>
</tr>
<tr>
<td></td>
<td>12:SSG (106)</td>
<td></td>
<td>[1] a,b,d,e,g</td>
<td></td>
</tr>
<tr>
<td>Lang et al. (2000)330</td>
<td>1:CBT (30)</td>
<td>Baseline data</td>
<td>a,b,d,e,g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>baseline</td>
<td></td>
<td>[1] a,b,d,e,g</td>
<td></td>
</tr>
<tr>
<td>Stephens et al. (2000)343</td>
<td>2:MI (88)</td>
<td>14:RPSG (117)</td>
<td>a,b,c,d,g</td>
<td>[1] a,b,c,d,g</td>
</tr>
<tr>
<td></td>
<td>DTC (86)</td>
<td>DTC (86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:MI (88)</td>
<td>14:RPSG (117)</td>
<td>a,b,c,d,g</td>
<td>[1] a,b,c,d,g</td>
</tr>
<tr>
<td></td>
<td>DTC (86)</td>
<td>DTC (86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copeland et al. (2001)342</td>
<td>1:CBT (82)</td>
<td>6:CBT (78)</td>
<td>a,b,c,d,e</td>
<td>[1] c, d</td>
</tr>
<tr>
<td></td>
<td>DTC (69)</td>
<td>DTC (69)</td>
<td></td>
<td>[1] a, b, c, d</td>
</tr>
<tr>
<td></td>
<td>1:CBT (82)</td>
<td>6:CBT (78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DTC (69)</td>
<td>DTC (69)</td>
<td></td>
<td>[2] e</td>
</tr>
<tr>
<td>Budney et al. (2006)352</td>
<td>14:CBT+CM (30)</td>
<td>14:CBT (30)</td>
<td>a,b,c,d,e,g</td>
<td>[1] a</td>
</tr>
<tr>
<td></td>
<td>14:CBT (30)</td>
<td>CM (30)</td>
<td>ns</td>
<td>[1] a</td>
</tr>
<tr>
<td></td>
<td>CM (30)</td>
<td>CM (30)</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:CBT+CM (30)</td>
<td>CM (30)</td>
<td>[1] a</td>
<td>[1] a</td>
</tr>
<tr>
<td></td>
<td>14:CBT (30)</td>
<td>CM (30)</td>
<td>ns</td>
<td>[1] a</td>
</tr>
<tr>
<td></td>
<td>14:CBT+CM (30)</td>
<td>CM (30)</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>
| Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “-” symbol is used where an article did not include a follow-up assessment within one of these periods. The condition which achieved the more positive treatment outcome (for example, a greater reduction in cannabis use or improvement in well-being) is presented in square brackets (either [1], or [2]) along with the symbols for each measure (a through to g) where a statistically significant between-condition difference was noted. If no significant between-condition difference was noted at p < 0.05 on any included measure, “ns” denotes the non-significance. Unless otherwise stated, the treatment effect sizes were based on change in days of cannabis use (mean and standard deviation) from baseline to final follow-up.

*Budney et al. did not provide the sample size at final follow-up, instead the effect sizes were based on the reported attrition of 71% spread evenly across the three trial conditions.


Treatment Outcomes “a” cannabis using days, “b” quantity per day, “c” cannabis dependence severity, “d” cannabis-related problems, “e” psychological well-being, “f” meaningful change, “g” other drug use
Table 2.6 Cognitive behavioural cannabis use interventions – Cannabis use outcomes

<table>
<thead>
<tr>
<th>Articles</th>
<th>Treatment number of sessions : intervention (N)</th>
<th>Collateral measures</th>
<th>Measures used to check fidelity</th>
<th>A = Days of use (%)</th>
<th>B = Point-prevalence abstinence (%)</th>
<th>Significant predictors of cannabis use frequency at final follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephens et al.</td>
<td>10:RP (106)</td>
<td>Urine, Supportive</td>
<td>Satisfaction, session recording &amp; feedback</td>
<td>A = Days of use (%)</td>
<td>B = Point-prevalence abstinence (%)</td>
<td>Gender (being male)</td>
</tr>
<tr>
<td>(1994)</td>
<td></td>
<td>friend/family</td>
<td></td>
<td>A 20 B 49</td>
<td>A 33 B 33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12:SSG (106)</td>
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<td></td>
<td></td>
<td>A 31 B 49</td>
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<td>A 36 B 40</td>
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<td>A 46 B 26</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>A 48 B 18</td>
<td></td>
</tr>
<tr>
<td>Lang et al.</td>
<td>1:CBT (30)</td>
<td>None</td>
<td>None</td>
<td>A 46^ ?</td>
<td>B 42^ ?</td>
<td></td>
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<tr>
<td>(2000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Stephens et al.</td>
<td>2:MI (88)</td>
<td>Supportive friend/family</td>
<td>Satisfaction</td>
<td>A - -</td>
<td>B 26* 39</td>
<td>Treatment attendance was tested and not significant</td>
</tr>
<tr>
<td>(2000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B 30* 32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:RPSG (117)</td>
<td></td>
<td></td>
<td></td>
<td>B 40* 29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DTC (86)</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Copeland et al.</td>
<td>1:CBT (82)</td>
<td>None</td>
<td>Session recording &amp; feedback</td>
<td>A - -</td>
<td>B 45* 17</td>
<td>Treatment completion</td>
</tr>
<tr>
<td>(2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B 45* 21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:CBT (78)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>DTC (39)</td>
<td></td>
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</tr>
<tr>
<td>Budney et al.</td>
<td>CM (30)</td>
<td>Urine</td>
<td>Satisfaction</td>
<td>A 38* 27</td>
<td>B 51* 17</td>
<td>Treatment attendance was tested and not significant</td>
</tr>
<tr>
<td>(2006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B 64* 17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:CBT (30)</td>
<td></td>
<td></td>
<td>A 29* 28</td>
<td>B 36* 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:CBT+CM (30)</td>
<td></td>
<td></td>
<td>A 32* 44</td>
<td>B 33* 43</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A 38* 33</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B 42* 37</td>
<td></td>
</tr>
</tbody>
</table>

Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “*” symbol is used in the case where an article did not include a follow-up assessment within one of these periods. The “?” symbol is used to denote those cases where the required data was not reported by the article. As some authors presented percentages without decimal points, all data is presented with decimal points rounded to maintain consistency across studies.

^ Unless otherwise specified, the percentage of cannabis using days refers to the past 90 days; * per cent abstinent days in past month; ^ per cent abstinent days in past week

Combination cannabis use interventions - Motivational enhancement therapy plus cognitive behavioural therapy

To date, nine trials have investigated the efficacy of cannabis use interventions which combined MET and CBT (MET+CBT). One of these trials included multiple cannabis interventions (Dennis et al.) and due to a heavier focus on family therapy-based interventions, this trial is discussed in the following section.

The first trial to assess a MET+CBT-based intervention with a long-term follow-up assessment was also the most comprehensive trial to investigate the utility of any cannabis use intervention among adults to date. This trial was conducted by the Marijuana Treatment Project Research Group (MTPRG) in 2004. The research group recruited 450 adult participants (68% male, with a mean age of 36 years), mainly from newspaper advertisements, at three collaborating treatment sites. Participants were randomised to receive either: 1) 2 one-hour MET-based sessions delivered four weeks apart to allow for feedback on changes (n=146); 2) nine sessions of an MET+CBT intervention (with additional focus given to mental health concerns where needed; referred to as case management) delivered over 12 weeks (n=156); or 3) a four month delayed treatment control group (DTC; n=148). Follow up data was collected face-to-face at four and nine months and by telephone at 15 months (this assessment was limited to cannabis frequency only) from baseline assessment for a minimum of 83% of participants across the three sites. The control group was not assessed post four months as these participants then entered treatment.

The authors defined clinically significant improvement as complete 90-day abstinence or the absence of abuse or dependence symptoms (as measured by the Structured Clinical Interview for the DSM-IV at four and nine month follow-up). At four months
the two-session MET and the nine-session MET+CBT conditions showed statistically
greater rates of ‘improvement’ compared to the DTC condition (17% and 30%
respectively improved, compared to 7%). However, there was no difference between
conditions regarding the quantity of cannabis used on a typical day or the severity of
cannabis dependence. As the DTC group was delayed for four months, this condition
was not present in the nine and 15-month follow-up assessments. As such, comparisons
were made between the intervention groups only. No statistically significant differences
in ‘improvement’, or cannabis-related problems, or psychological functioning were
observed between conditions at the nine month follow-up (15% improved in the MET
condition compared to 25% in the MET+CBT condition). Participants in the
MET+CBT condition, however, reported a statistically significantly lower percentage of
smoking days in the past 90 days compared to those in the MET condition at the four,
nine, and 15-month follow-up. This between-group difference generalized across the
three sites and was not associated with ethnicity or gender.

Notably, later analysis of the study data failed to find a statistically significant
relationship between outcome and adherence to the MET+CBT treatment, with those
attending one session reporting comparable outcomes to those attending nine
sessions. Stronger working alliance, however, was found to significantly predict
fewer cannabis using days in both treatment conditions across follow-up assessments.

Additional study regarding face-to-face MET+CBT cannabis use interventions has been
conducted to determine the importance of treatment duration and intensity, mode of delivery, and the utility of contingency management. Stephens et
al. conducted an initial study regarding the importance of treatment intensity in 2005. These authors were interested to determine if treatment seekers would utilise optional
treatment sessions in addition to a brief intervention and whether the number of sessions attended predicted treatment outcomes. A total of 203 participants were recruited from media advertisements and, post screening, 87 participants (75% male, with a mean age of 36 years) were randomly allocated to receive: 1) the same nine session MET+CBT intervention developed by the MTPRG (n=44); or 2) a cut down four session version of this intervention with up to an additional 13 optional treatment episodes of one to three weekly sessions delivered over 30 months (n=43). Follow up data was collected at baseline and at five time points over 28 months for 86% of participants.

Just over one third (37%) of the four session intervention participants opted to attend any of the optional sessions. No statistically significant differences between groups were observed in cannabis use outcomes throughout follow-up. Although the small sample size prevented statistical comparison, participants who made use of at least one of the optional sessions showed a trend toward a greater number of abstinent days in the past 90 days at 28 month follow-up. Participants who attended three to five optional sessions, however, reported a greater percentage of cannabis using days compared to those who attended one to two, or six to 13 optional sessions. The greatest treatment outcome came from participants attending at least six of the optional treatment episodes and thus receiving the greatest duration of treatment. This finding is supported by previous work demonstrating that duration of treatment (but not intensity) is correlated with improved treatment outcomes in alcohol treatment. Notably, this trial demonstrated that few cannabis users with an initial interest in seeking treatment remain motivated even when treatment is made available and free.
In a second trial relating to the importance of treatment intensity, Hoch et al.\textsuperscript{356} were interested to determine if a 10 session MET+CBT intervention targeting mental health concerns would engender greater treatment outcomes than a less intensive, manual-based, standardised version of the same intervention.\textsuperscript{356} A total of 133 participants with CUD (79\% male, with a mean age of 24 years) were randomly allocated to receive, 1) ten 90-minute sessions of a MET+CBT-based intervention with a component targeting participant psychosocial health ($n=39$), 2) the same MET+CBT intervention but with the targeting component delivered in less detail ($n=51$), or 3) a delayed treatment control condition (DTC; $n=31$). Follow-up comparisons were conducted between the intervention and DTC conditions at treatment end, and between the intervention conditions only at three and six months from baseline (20\% of participants were lost to follow-up).

Participants from both intervention conditions reported a greater reduction in cannabis use frequency and improvements in measures of mental health compared to the DTC condition at the end of treatment, although there was no statistically significant difference between the intervention conditions in the reductions made. In addition there were no noted significant differences between the intervention groups in cannabis use reductions at the time of three and six month follow-up assessments. Specifically, participants from both interventions reported statistically significant reductions in cannabis use at six months (not three months) and improvements in indices of problems relating to drug use, legal concerns and other general concerns, and in the measure of psychopathology. This lack of between-group variation may have reflected a lack of statistical power due to the small sample size in each group.
Notably, at the end of intervention, 49% of intervention participants reported abstinence from cannabis in the past seven days (41% according to urinalysis, and 69% of a subsample of those who completed the intervention) compared to 13% of the control group. Unfortunately, as the period of “complete abstinence” was limited to seven days, a comparison of treatment outcomes with trials reporting 28- and 90-day abstinence periods loses validity. Assuming the reported abstinence rates did not reduce if the period of abstinence was extended, however, the proportion of participants reporting abstinence would be among the highest of any cannabis intervention trial which did not include contingency management.

As improvements in psychosocial functioning were noted by both intervention groups, the additional focus on these outcomes was not required to achieve favourable outcomes. These results support the argument that intervention trials should employ more specific measures of psychosocial outcomes for two reasons. First, the authors had hypothesised that the novel condition which focussed on psychosocial health would engender greater treatment outcomes in this regard compared to the condition without this focus (based on a prior assessment of participant needs). Second, the measures used in this trial were common to previous interventions which did not report favourable outcomes. As such, further research is required to determine the precise mechanisms by which cannabis interventions can effect change to psychosocial health. One possibility to be researched is that an individual may need to achieve continuous abstinence for a certain period before significant improvements in psychosocial outcomes can be achieved. Unfortunately, no cannabis intervention trial has reported the precise period of abstinence achieved by participants who reported a statistically significant improvement in psychosocial outcomes.
In order to determine the importance of treatment duration, Jungerman et al. delivered a MET+CBT-based intervention over one and three months. These authors randomly allocated 160 participants (80% male, with a mean of 32 years) to receive: 1) four weekly sessions of MET+CBT \( (n=56) \), 2) four sessions of MET+CBT delivered over three months \( (n=52) \), or 3) a delayed treatment control condition (DTC; \( n=52 \)). A follow-up assessment was conducted at 4 months from baseline with self-report cannabis use validated by urinalysis (38% of participants were lost to follow-up).

Although both intervention groups reported statistically significantly greater reductions in cannabis use frequency and quantity compared to the DTC condition, no statistically significant difference between the intervention groups was noted. However, participants in the three-month intervention reported statistically significantly greater reductions in severity of cannabis dependence compared to the one-month intervention and DTC condition. Notably, no condition engendered a statistically significant reduction in cannabis use related problems. As such, only partial support was provided for the importance of treatment duration.

An initial trial regarding the importance relating to the mode by which an MET+CBT intervention is delivered (individual or group) was conducted by Sobell et al. in 2006. These authors compared a four session MET+CBT intervention delivered to individual participants with the same session delivered in a group format. Three separate arms of this study implemented the same interventions with three separate groups - cannabis users \( (n=17) \), cocaine users \( (n=35) \), and alcohol users \( (n=212) \). All three groups reported on the frequency of their respective substance at 12 months post-treatment. Among those who received the intervention conditions for cannabis use (77% male, with a mean age of 30 years), participants from both the individual and group
intervention conditions reported a statistically significant reduction in cannabis use at follow-up, with no statistically significant between-condition differences. As the cost of delivering the intervention in a group format was lower than in the individual format, this outcome was promising. Unfortunately, the small sample size was a substantial limitation in this study and a replication of these findings is yet to be conducted.

The first trial to assess the utility of contingency management (CM) in accompanying a MET+CBT-based intervention was conducted by Budney et al. in 2000. These authors recruited 60 adult participants (83% male, with a mean age of 33 years) from outpatient treatment centres and randomly allocated them to receive either: 1) four 60-90 minute MET based sessions (n=20); 2) 14 weekly one-hour sessions based on MET with the addition of coping skills training from CBT (n=20); or 3) the MET+CBT intervention with the addition of CM (participants could earn a total of $570 for continued abstinence; n=20). Follow-up data was collected over 14 weeks post-treatment for 75% of participants with urinalysis validating self-report of cannabis use.

Participants allocated to the MET+CBT+CM condition achieved a statistically significantly greater average duration of abstinence (4.8 weeks) than both the MET (1.6 weeks) and MET+CBT (2.3 weeks) conditions. This trial demonstrated that the additional resources required to couple CM with a MET+CBT treatment were justified in that a moderate to large effect size was observed between groups. Specifically, the MET+CBT+CM condition produced significantly greater treatment outcomes than the MET+CBT intervention alone, which in turn, produced greater treatment outcomes than the MET condition alone. Notably the support for this combined intervention was limited to frequency of cannabis use as there was no difference between conditions regarding reduction in the quantity of cannabis used on a typical day, the severity of
dependence, or the frequency of other substance use, nor regarding improvements in psychological functioning. The lack of differences between-conditions was perhaps not surprising given the low statistical power of this initial study due to the small sample size. Unfortunately, these authors did not report if the reported reductions in cannabis use frequency reflected a clinically meaningful improvement.

Carroll et al.\textsuperscript{354} conducted a second trial to determine if a MET+CBT cannabis use intervention coupled with CM produced significantly greater treatment outcomes compared to MET+CBT alone or an alternative behavioural treatment. This trial also served as the only investigation of the utility of a MET+CBT-based intervention among adolescent cannabis users. These authors recruited 132 adolescent participants (90% male, aged between 18 and 25 years) from the criminal justice system and randomly allocated them to receive either: 1) eight weekly MET+CBT sessions (n=35); 2) the MET+CBT sessions coupled with CM (n=33); 3) eight weekly group sessions on drug counselling not unlike a 12-step program (DC; n=33); or 4) the drug counselling group coupled with CM (DC+CM; n=34). Follow-up data was collected over six months for 96% of participants, with urinalysis validating self-report.

The authors defined meaningful improvement as treatment completion and at least 14 days of abstinence \textit{during} treatment (verified by urinalysis). Statistically significantly more adolescent participants improved when allocated to the CM conditions compared to the non-CM conditions although there was no statistically significant difference in the rates of improvement reported by the MET+CBT or DC interventions (46% for MET+CBT+CM, 44% for DC+CM, 31% for MET+CBT, and 21% for DC). Participants receiving the MET+CBT conditions (with or without CM), however, did
report significantly greater reductions in frequency of use at three and six month follow-up compared to participants receiving the DC conditions (with or without CM).

A comment on MET+CBT-based cannabis use interventions

To summarise, support for MET+CBT interventions comes from four main sources. First, unlike MI-based intervention trials, several MET+CBT intervention trials have been conducted which include follow-up assessments beyond the short-term. These trials have each shown that MET+CBT engendered greater reductions in cannabis use compared to baseline frequency of use at six months,341,345,354-356 and at 12 months.335

341,345 As shown in Table 2.8, the reported MET+CBT interventions engendered moderate to large treatment effect sizes on cannabis use reductions. Second, this intervention plus contingency management has shown statistically significant reductions in cannabis use compared to MI only interventions at 12 months,345,353 and an eight session drug counselling group at six months.354 However, support for the MET+CBT+CM interventions was not consistent as one recent trial depicted no statistically significant difference between this combined intervention compared to CM alone.341 Third, comparable reductions in cannabis use frequency have been shown by interventions of low intensity (three to five sessions;398 standardised manual driven delivery341) and brief duration (one month338) compared to greater intensity (six to 13 sessions; intensive focus on mental health concerns) and longer duration (three months). Fourth, these interventions also have shown comparable reductions in cannabis use frequency when delivered in a group format as compared to the more resource intensive individual format.335

Support for MET+CBT interventions is tempered by four factors. First, this intervention style, although promising in engendering reductions in cannabis use frequency, is yet to
engender significant reductions in other drug use. Second, to date only two MET+CBT trials have reported a statistically significant treatment effect on cannabis dependence severity or cannabis-related problems reported in a follow-up assessment of more than three months. Third, as with previous research regarding MET- and CBT-based cannabis use interventions, the participants recruited into trials of MET+CBT interventions have been mostly male (53% to 90% across trials) and young adults (aged an average of 21 to 36 years). As such, the support shown for this intervention may not generalise to female populations or among older adults. Fourth, the mechanisms of change in these interventions are not well known, with little study regarding the predictors of treatment outcomes. Some study has suggested that post-treatment outcome can be predicted by those achieving early gains during treatment, and through greater treatment adherence. Further, although self-efficacy, and alcohol use at baseline, have each been investigated, neither significantly predicted treatment outcomes. Regardless, factors specific to the MET+CBT intervention have not yet been adequately explored. The need for such study was highlighted by Kadden et al.’s recent study of a nine session MET+CBT+CM intervention which failed to report statistically significantly greater outcomes compared to a CM-based intervention, as well as a control condition accounting for the therapists’ attention.
## Table 2.7 Motivational interviewing and cognitive behavioural therapy combined interventions for cannabis use – Participants, measures, and loss to follow-up

<table>
<thead>
<tr>
<th>Articles</th>
<th>Participants</th>
<th>Cannabis</th>
<th>Dependence</th>
<th>Measures of Treatment Outcomes</th>
<th>Attrition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budney et al. (2000)</td>
<td>Male 83 %</td>
<td>Age 33 yrs</td>
<td>30-day self-report</td>
<td>ASI, DSM-III-R, ASI, MCQ</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DSM-III-R (Axis 1), BSI, BDI</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RTC, SCQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DSM-III-R</td>
<td></td>
</tr>
<tr>
<td>MTPRG (2004)</td>
<td>Male 68 %</td>
<td>Age 36 yrs</td>
<td>90-day TLFB</td>
<td>DSM-IV (SCID), MPS, ASI</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Included but not detailed</td>
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<td>Included but not detailed</td>
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<td></td>
<td></td>
<td>DSM-IV (SCID), days drinking</td>
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<td></td>
<td></td>
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<td></td>
<td>90-day abstinence OR no CUD symptoms</td>
<td></td>
</tr>
<tr>
<td>Stephens et al. (2005)</td>
<td>Male 75 %</td>
<td>Age 36 yrs</td>
<td>90-day TLFB</td>
<td>-</td>
<td>14</td>
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<td>Included but not detailed</td>
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<td></td>
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<td></td>
<td>Treatment completion and 14-day abstinence</td>
<td></td>
</tr>
<tr>
<td>Sobell et al. (2006)</td>
<td>Male 77 %</td>
<td>Age 30 yrs</td>
<td>90-day TLFB</td>
<td>-</td>
<td>18</td>
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<td></td>
<td>Treatment completion and 14-day abstinence</td>
<td></td>
</tr>
<tr>
<td>Carroll et al. (2006)</td>
<td>Male 90 %</td>
<td>Age 21 yrs</td>
<td>28-day TLFB</td>
<td>-</td>
<td>4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>ASI</td>
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<td>-</td>
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</tr>
<tr>
<td>Kadden et al. (2007)</td>
<td>Male 71 %</td>
<td>Age 33 yrs</td>
<td>90-day TLFB</td>
<td>ASI</td>
<td>11</td>
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<tr>
<td></td>
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<td>MPS, MCQ (DA ST)</td>
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<td></td>
<td></td>
<td></td>
<td>Cigarettes per day</td>
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</tr>
<tr>
<td>Juengerman et al. (2007)</td>
<td>Male 80 %</td>
<td>Age 32 yrs</td>
<td>90-day TLFB</td>
<td>DSM-III-R, ASI</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MPS</td>
<td></td>
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<td>-</td>
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</tr>
<tr>
<td>Hoch et al. (2012)</td>
<td>Male 79 %</td>
<td>Age 24 yrs</td>
<td>7-day TLFB</td>
<td>ASI, ASI</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BSI, ASI</td>
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<td>URICA</td>
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<td></td>
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<td></td>
<td></td>
<td>ASI (alcohol)</td>
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</tbody>
</table>

* Attrition refers to the loss to follow-up at final assessment. As some authors presented percentages without decimal points, those articles providing data with decimal points were rounded to maintain consistency across studies; ** Budney et al. reported rates of treatment attrition rather than loss to follow-up which was

Table 2.8 Motivational interviewing and cognitive behavioural therapy combined interventions for cannabis use – Treatment condition comparisons

<table>
<thead>
<tr>
<th>Articles</th>
<th>Between-group comparison</th>
<th>Included measures</th>
<th>Condition with significantly greater outcome and the measures showing a significant between-condition difference</th>
<th>Treatment effect size d (95% CI) at final FU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number of sessions : condition [1] (N) compared to [2] (N)</td>
<td></td>
<td>Treatment end</td>
<td>Short FU</td>
</tr>
<tr>
<td>Budney et al. (2000)&lt;sup&gt;335&lt;/sup&gt;</td>
<td>4:MET (20) 4:MET (20) 14:MET+CBT (20) 14:MET+CBT+CM (20) 14:MET+CBT+CM (20)</td>
<td>a,b,c,d,e,g</td>
<td>1.4 (0.7 - 2.1)</td>
<td>3.4 (2.4 - 4.4)</td>
</tr>
<tr>
<td>MTPRG (2004)&lt;sup&gt;345&lt;/sup&gt;</td>
<td>2:MET (146) 2:MET (146)</td>
<td>a,b,c,d,e,g</td>
<td>0.59*</td>
<td>1.14*</td>
</tr>
<tr>
<td>Stephens et al. (2005)&lt;sup&gt;355&lt;/sup&gt;</td>
<td>9:MET+CBT+CM (44) MET+CBT+CM+PRN (43)</td>
<td>a</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Carroll et al. (2006)&lt;sup&gt;354&lt;/sup&gt;</td>
<td>8:MET+CBT (35) &amp; 8:MET+CBT+CM (33) 8:MET+CBT+CM (33) 8:GC+CM (34)</td>
<td>a,d,f</td>
<td>0.3 (-0.2 - 0.6)*</td>
<td>0.3 (-0.6 - 0.6)*</td>
</tr>
</tbody>
</table>
### Table 2.8 (cont.) Motivational interviewing and cognitive behavioural therapy combined interventions for cannabis use – Treatment condition comparisons

<table>
<thead>
<tr>
<th>Articles</th>
<th>Between-group comparison</th>
<th>Included measures</th>
<th>Condition with significantly greater outcome and the measures showing a significant between-condition difference</th>
<th>Treatment effect size d (95% CI) at final FU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number of sessions : condition [1] (N) compared to [2] (N)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kadden et al. (2007)</td>
<td>9:MET+CBT+CM (63)</td>
<td>a,b,c,d,g</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>9:MET+CBT (61) &amp; 9:TAC (62) &amp; CM (54)</td>
<td></td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>9:MET+CBT (61)</td>
<td></td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>9:TAC (62)</td>
<td></td>
<td>[2] a</td>
<td>[1] a, b</td>
</tr>
<tr>
<td></td>
<td>CM (54)</td>
<td></td>
<td>[2] ns</td>
<td>ns</td>
</tr>
<tr>
<td>Jungerman et al. (2007)</td>
<td>4:MI+CBT-1 (56)</td>
<td>a,b,c,d,g</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>DTC (52)</td>
<td></td>
<td>-</td>
<td>[1] a, b</td>
</tr>
<tr>
<td></td>
<td>DTC (52)</td>
<td></td>
<td>-</td>
<td>[1] a, b, c</td>
</tr>
<tr>
<td></td>
<td>4:MI+CBT-3 (52)</td>
<td></td>
<td>-</td>
<td>[2] ns</td>
</tr>
<tr>
<td></td>
<td>4:MI+CBT-1 (56)</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hoch et al. (2012)</td>
<td>10:ST-MET+CBT+PPS (51)</td>
<td>a,c,d,e,g</td>
<td>[1] a</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>&amp; 10:TST-MET+CBT+PPS (39)</td>
<td></td>
<td>[1] a,c,d (legal, medical, employment, family) e</td>
<td>[1] c,d (legal, family) e</td>
</tr>
<tr>
<td></td>
<td>10:ST-MET+CBT+PPS (51)</td>
<td></td>
<td>[1] a,c,d (legal, medical, employment, family) e</td>
<td>[1] c,d (legal, family) e</td>
</tr>
<tr>
<td></td>
<td>&amp; 10:TST-MET+CBT+PPS (39)</td>
<td></td>
<td>[1] a,c,d (legal, medical, employment, family) e</td>
<td>[1] c,d (legal, family) e</td>
</tr>
</tbody>
</table>

Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “-” symbol is used in the case where an article did not include a follow-up assessment within one of these periods. The condition which achieved the more positive treatment outcome (for example, a greater reduction in cannabis use or improvement in well-being) is presented in square brackets (either [1], or [2]) along with the symbols for each measure (a through to g) where a statistically significant between-condition difference was noted. If no significant between-condition difference was noted at p<0.05 on any included measure, “ns” denotes the non-significance. Unless otherwise stated, the treatment effect sizes were based on change in days of cannabis use (mean and standard deviation) from baseline to final follow-up.

* These authors provided the effect sizes reported


Treatment Outcomes “a” cannabis using days, “b” quantity per day, “c” cannabis dependence severity, “d” cannabis-related problems, “e” psychological well-being, “f” meaningful change, “g” other drug use
<table>
<thead>
<tr>
<th>Articles</th>
<th>Treatment number of sessions : intervention (N)</th>
<th>Collateral Measures used to check fidelity</th>
<th>A = Days of use (%)&lt;sup&gt;3&lt;/sup&gt;</th>
<th>B = Point-prevalence abstinence (%)</th>
<th>Significant predictors of cannabis use frequency at final follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budney et al. (2000)&lt;sup&gt;553&lt;/sup&gt;</td>
<td>4:MET (20)</td>
<td>Urine None</td>
<td>- 43 25&lt;sup&gt;∗&lt;/sup&gt; 22&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>- 5 10 35</td>
<td>Self-efficacy was tested and not significant</td>
</tr>
<tr>
<td></td>
<td>14:MET+CBT (20)</td>
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<td></td>
<td>14:MET+CBT+CM (20)</td>
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<tr>
<td>MTPRG (2004)&lt;sup&gt;345&lt;/sup&gt;</td>
<td>2:MET (146)</td>
<td>Urine, supportive friend/family Session recording &amp; feedback</td>
<td>- 56 36</td>
<td>60 9 23</td>
<td>Alcohol use and treatment adherence were tested and not significant, strong working alliance improved outcomes</td>
</tr>
<tr>
<td></td>
<td>9:MET+CBT+CM (156)</td>
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<td>DTC (148)</td>
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<tr>
<td>Stephens et al. (2005)&lt;sup&gt;355&lt;/sup&gt;</td>
<td>9:MET+CBT+CM (44)</td>
<td>Urine, supportive friend/family Session recording &amp; feedback</td>
<td>- 30&lt;sup&gt;∗&lt;/sup&gt; 40&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>45&lt;sup&gt;∗&lt;/sup&gt; 14&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>3-5 sessions produced greater outcomes than 0,1-2, or 6-13 sessions</td>
</tr>
<tr>
<td></td>
<td>MET+CBT+CM+PRN (43)</td>
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<tr>
<td>Sobell et al. (2006)&lt;sup&gt;335&lt;/sup&gt;</td>
<td>4:GSC-I (9)</td>
<td>None None</td>
<td>51&lt;sup&gt;∗&lt;/sup&gt; -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:GSC-G (8)</td>
<td></td>
<td>51&lt;sup&gt;∗&lt;/sup&gt; -</td>
<td>- -</td>
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</tr>
<tr>
<td>Carroll et al. (2006)&lt;sup&gt;344&lt;/sup&gt;</td>
<td>8:MET+CBT (35)</td>
<td>Urine Session recording &amp; feedback</td>
<td>73&lt;sup&gt;∗&lt;/sup&gt; 64&lt;sup&gt;∗&lt;/sup&gt; 71&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>30&lt;sup&gt;∗&lt;/sup&gt; 27&lt;sup&gt;∗&lt;/sup&gt; 33&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>Contingency management was effective in each group</td>
</tr>
<tr>
<td></td>
<td>8:MET+CBT+CM (33)</td>
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<td>8:DC (33)</td>
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<td>8:DC+CM (34)</td>
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<tr>
<td>Kadden et al. (2007)&lt;sup&gt;341&lt;/sup&gt;</td>
<td>9:MET+CBT (61)</td>
<td>Urine None</td>
<td>50&lt;sup&gt;∗&lt;/sup&gt; 13&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>40&lt;sup&gt;∗&lt;/sup&gt; 19&lt;sup&gt;∗&lt;/sup&gt;</td>
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<td>9:TAC (62)</td>
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<td>9:MET+CBT+CM (63)</td>
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<td>CM (54)</td>
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<td>Jungerman et al. (2007)&lt;sup&gt;338&lt;/sup&gt;</td>
<td>4:MI+CBT-1 (56)</td>
<td>Urine None</td>
<td>65&lt;sup&gt;∗&lt;/sup&gt; -</td>
<td>- -</td>
<td></td>
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<tr>
<td></td>
<td>4:MI+CBT-3 (52)</td>
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<td>DTC (52)</td>
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</table>
Table 2.9 (Cont.) Motivational interviewing and cognitive behavioural therapy combined interventions for cannabis use – Cannabis use outcomes

<table>
<thead>
<tr>
<th>Articles</th>
<th>Treatment number of sessions : intervention (N)</th>
<th>Collateral</th>
<th>Measure used to check fidelity</th>
<th>A = Days of use (%)&lt;sup&gt;3&lt;/sup&gt;</th>
<th>B = Point-prevalence abstinence (%)</th>
<th>Significant predictors of cannabis use frequency at final follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Treatment end</td>
<td>Short FU</td>
<td>Medium FU</td>
</tr>
<tr>
<td>Hoch et al.</td>
<td>10-ST-MET+CBT+PPS (51) &amp; 10-TST-MET+CBT+PPS (39) &amp; DTC (31)</td>
<td>Urine</td>
<td>Fidelity measures</td>
<td>A = 8^&lt;sup&gt;49^&lt;/sup&gt;</td>
<td>B = 14^&lt;sup&gt;44^&lt;/sup&gt;</td>
<td>A = 12^&lt;sup&gt;41^&lt;/sup&gt;</td>
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</tbody>
</table>

Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “-” symbol is used in the case where an article did not include a follow-up assessment within one of these periods. The “?” symbol is used to denote those cases where the required data was not reported by the article. As some authors presented percentages without decimal points, all data is presented with decimal points rounded to maintain consistency across studies.

<sup>3</sup> Unless otherwise specified, the percentage of cannabis using days refers to the past 90 days; * per cent abstinent days in past month; ^ per cent abstinent days in past week; ¥ per cent abstinent days in past 60 days; $ This figure was provided by graph in the relevant article and so was estimated for the purposes of this table; ¥ As there were no significant differences in treatment outcomes between intervention groups the results were presented as a total sample (n=14)

**Cannabis use interventions based on family therapy**

To date seven trials have investigated the efficacy of using interventions based on family therapy (FT) to reduce cannabis use.\textsuperscript{332, 333, 337, 348-350, 361} Only three of these trials included a follow-up assessment greater than six months.\textsuperscript{332, 348, 350} The first of these trials was conducted by Liddle et al. in 2001.\textsuperscript{348} These authors recruited 152 adolescent cannabis users (80% male, with a mean age of 16 years) primarily from the juvenile justice system (61%) and randomly allocated them to receive either: 1) sixteen 90-minute sessions of multidimensional family therapy (MDFT) delivered over five months, focusing on family interactions that lead to substance use and building on social skills ($n=47$; sessions were delivered to individual and multiple family members, one family at a time, throughout the intervention); 2) sixteen 90-minute sessions of group therapy involving groups of six to eight adolescents led by two counsellors including work on social skills, problem solving and building on social support ($n=53$); or 3) 16 sessions of a multifamily educational intervention (groups of three to four families were encouraged to support each other and work on improving interfamily relationships; $n=52$). Follow up data was collected at five months from baseline (at the end of treatment) and again at six and 12 months from the end of treatment (40% of participants were lost to follow-up), with urinalysis validating self- and collateral-report.

The authors defined clinically meaningful improvement as smoking less than three times per week in the past 30 days, no use of “hard drugs” and evidence of at least passing grades in school (a 2.0 Grade Point Average). Improvement was measured at final follow up and the MDFT intervention showed a statistically significantly greater proportion of participants reaching improvement (45% on drug use, and 76% on school
grades) than did the group therapy (32% on drug use, and 60% on school grades) or multifamily education (26% on drug use, and 40% on school grades). This initial trial supported the utility of family therapy compared to alternative treatments for adolescents, although whether or not the participants achieved abstinence was not reported.

The second trial to include more than a six-month follow-up assessment of a FT-based intervention was also the largest randomized field study of any adolescent cannabis treatment conducted to date; the Cannabis Youth Treatment (CYT) study. The data produced from this large trial was later used by several authors of the main report to provide greater detail on the predictors of treatment outcomes. The authors of the CYT study screened 1244 young individuals over two years from four different treatment sites located in four different US states. Post screening, 600 adolescents (83% male, aged between 13-18 years) with CUD (71% used cannabis weekly at baseline) were allocated to one of five different intervention conditions. As it was not feasible to randomly assign participants to all five conditions at each of the four treatment sites, participants were randomly assigned to one of three conditions with one intervention condition kept constant between the sites to assist with comparisons.

The intervention groups are summarised here alongside reference to their respective treatment manuals. The interventions were: 1) five sessions of MET+CBT (two individual and three group sessions) conducted over seven weeks (n=202; referred to as MET+CBT-5); 2) 12 sessions of MET+CBT (two individual and 10 group sessions) conducted weekly (n=96; referred to as MET+CBT-12); 3) the MET+CBT-12 intervention with the addition of six parent education group sessions (targeting

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ii A larger participant group size was required for the MET-CBT5 intervention as this condition was delivered between treatment sites to aid with between group comparisons
adolescent development, substance use, relapse and family roles), four whole-family home visits which focused on motivation building and building commitment to change, with case management to promote engagement in the intervention ($n=102$; a multidimensional family therapy intervention or MDFT); 1) 10 individual sessions focused on behavioural change in drug use and lifestyle with an additional four sessions with parents focused on effective parenting, communication, and problem solving, all sessions were delivered over 12-14 weeks ($n=100$; an adolescent community reinforcement approach or ACRA); 2) six individual sessions, plus three sessions with parents only, and six sessions with the whole family (with the sessions focused on engaging an alliance between family members to identify and reach substance use goals), all sessions were delivered over 12-14 weeks ($n=100$; a family support network intervention or FSN).

A total of at least 71% of adolescent participants completed at least 75% of the planned treatment period across all intervention conditions. Follow up data was collected every three months, for 12 months from over 90% of participants, with urinalysis validating results at intake and three and six month follow-up for a minimum of 76.5% of adolescents. More recently, Tetzlaf et al. also reported on 30 month outcomes for 90% of participants, although the five interventions were collapsed and participants were treated as a whole. The high rates of retention that were attained across this long-term follow-up were attributed to the use of a case management model and an “Engagement, Verification, Maintenance and Confirmation” protocol.

All intervention groups showed statistically equivalent treatment outcome gains across all follow-up assessments. During treatment, 39% of participants attained 30 days or more of abstinence. A total of 17% to 34% of participants across conditions were
abstinent at 12 months, and 15% of participants at 30 months. Significant gains in a number of other problems were sustained at the 12-month follow-up, and a statistically significant association between reduced frequency of use and improved quality of life was observed across follow-ups.

In addition, this study pioneered the reporting of cost effectiveness information (per day of abstinence and per abstinent participant at final follow up) in cannabis intervention research. Analysis of each treatment condition revealed that the MET+CBT-5 intervention and the ACRA condition were the most cost effective in comparison to the MET+CBT-12, FSN, and MDFT conditions.

Four FT-based cannabis intervention studies have assessed predictors of treatment outcomes. The first found that the strength of the early adolescent working alliance and baseline rates of substance use were significant predictors of outcomes at three and six months in the ACRA condition (in the CYT trial, variance in baseline substance use between conditions was addressed by analytic procedures). The second found that the strength of the working alliance between the counsellor and participant significantly predicted symptoms of CUD at three month follow-up in the MDFT condition, but only when the relationship between the counsellor and the participant’s parent was of moderate or high strength. This led the authors to hypothesise that agreement on the goals and tasks of therapy by the counsellor, adolescent and parent likely improved parental-participant interactions and facilitated the treatment effect. The two additional studies supported this hypothesis. First, it was found that parental monitoring of adolescent behaviour was statistically significantly associated with adolescent cannabis use across follow-up in the MDFT condition. Second, the most
effective style of parental monitoring was authoritative in nature (although this monitoring only accounted for 3% of the variance in adolescent cannabis use).\textsuperscript{458} Although the CYT trial identified effective treatments, the generalisation of results was somewhat limited. That is, the results may apply primarily to adolescents coerced into treatment via legal or parental involvement which may represent a sample who are more likely to respond to treatment due to completing treatment.\textsuperscript{466} In addition, the trial did not include a no-treatment control group, and as such, could not establish that the reported treatment outcomes were greater than could be achieved without professional intervention. This was problematic as no statistically significant difference in treatment outcomes was noted between conditions and the specific interventions that were included did not have a background of research showing favourable comparisons with no-treatment control groups.

The most recent trial to include a 12-month follow-up assessment of a FT-based intervention was conducted by Liddle et al. in 2004,\textsuperscript{467} with long term outcomes reported in 2009.\textsuperscript{332} These authors randomly allocated 80 participants (74% male, with a mean age of 14 years) to receive either 1) sixteen 90-minute sessions of a MDFT intervention delivered twice weekly for 12-16 weeks ($n=39$; treatment included both individual sessions with the participant only, and group sessions with the participant and family members), or 2) group counselling focussing on correcting social problems and poor social functioning as well as improving self-efficacy delivered with the same frequency and duration of sessions as the MDFT intervention ($n=41$; groups consisted of four to six participants). Follow-up assessments were conducted at post-treatment and six and 12 months from post-treatment (with 15% lost to follow-up). These authors defined meaningful improvement as achieving a frequency of cannabis use comparable
to the typical frequency of use in the community (8.5% of youths were considered to use cannabis in the community).

At each follow-up assessment, controlling for baseline substance use, participants allocated to the MDFT intervention reported statistically significantly greater reductions in cannabis and alcohol use and cannabis-related problems as well as significantly greater frequency of meaningful improvement. These positive treatment outcomes regarding reductions in cannabis use also have been replicated in a number of other trials of FT-based cannabis interventions with short to medium term follow-up assessments (three to six months).333, 337, 349, 361

A comment on Family therapy-based cannabis use interventions

To summarise, support for FT-based interventions comes from three main angles. First, the studies of FT-based cannabis treatments consistently depicted significant reductions in cannabis use at short to long term follow-up assessments compared to baseline use. As shown in Table 2.11, the treatment effect sizes on cannabis use reductions were small to moderate. Second, unlike MET- or CBT-based interventions, FT-based interventions have commonly reported significant improvements to adolescent psychological functioning and family cohesion.332, 333, 337, 348, 349, 361 Third, rates of study attrition in FT-based intervention trials are typically lower than in trials of MET- or CBT-based interventions (ranging from 0 to 21% in six trials, with two exceptions of 40% and 45%). Although this is a promising result, this may be due to the use of case management protocols by trial researchers (such as the “Engagement, Verification, Maintenance and Confirmation” protocol465) rather than factors specific to family-based treatments.
The support for FT-based interventions is tempered by two main factors. First, the interventions do not typically engender significantly greater treatment outcomes when compared to several different alternative cannabis-specific interventions, and more general substance use interventions. One exception to this was a trial comparing functional family-therapy to a CBT-based intervention. Second, the general efficacy of FT-based interventions is somewhat limited to adolescent populations with supportive parents or family members and further research is required to determine the utility of this intervention among adult populations or among those with family members who are not willing to cooperate.
Table 2.10 Family management interventions for cannabis use – Participants, measures, and loss to follow-up

<table>
<thead>
<tr>
<th>Articles</th>
<th>Participants</th>
<th>Cannabis use</th>
<th>Dependence</th>
<th>Related problems</th>
<th>Well-being</th>
<th>Self-motivation to reduce use</th>
<th>Other drug use</th>
<th>Meaningful improvement</th>
<th>Attrition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liddle et al. (2001)</td>
<td>80% 16 yrs</td>
<td>15-point Likert scale</td>
<td>-</td>
<td>-</td>
<td>AOB, GPA, GHPS</td>
<td>-</td>
<td>15-point Likert-type scale</td>
<td>Smoking &lt; 3 days per week, no other drug use, GPA of &gt;=2.0</td>
<td>40</td>
</tr>
<tr>
<td>Waldron et al. (2001)</td>
<td>84% 16 yrs</td>
<td>90-day TLFB</td>
<td>-</td>
<td>POSIT</td>
<td>CBCL</td>
<td>-</td>
<td>-</td>
<td>Smoking &lt; 10% of days</td>
<td>5</td>
</tr>
<tr>
<td>Latimer et al. (2003)</td>
<td>77% 16 yrs</td>
<td>ADI-R</td>
<td>PEI, DICA-IV</td>
<td>-</td>
<td>FAM, RTQ, SPSI, MSLQ</td>
<td>-</td>
<td>ADI-R (alcohol)</td>
<td>-</td>
<td>45</td>
</tr>
<tr>
<td>Dennis et al. (2004)</td>
<td>83% 13-18 yrs</td>
<td>GAIN-I</td>
<td>-</td>
<td>GAIN-I</td>
<td>GAIN-I</td>
<td>-</td>
<td>GAIN-I</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Kamon et al. (2005)</td>
<td>89% 16 yrs</td>
<td>30-day Self-report</td>
<td>-</td>
<td>-</td>
<td>CBCL, YSR, Parenting behaviours</td>
<td>-</td>
<td>Breath test, urine</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Stanger et al. (2009)</td>
<td>83% 16 yrs</td>
<td>90-day TLFB</td>
<td>-</td>
<td>-</td>
<td>CBCL, YSR, APQ</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>21</td>
</tr>
<tr>
<td>Liddle et al. (2004/09)</td>
<td>74% 14 yrs</td>
<td>30-day TLFB</td>
<td>-</td>
<td>GAIN-I</td>
<td>YSR, FES, NYSPDS, POSIT</td>
<td>-</td>
<td>GAIN (alcohol)</td>
<td>Tested against normative comparisons by POSIT</td>
<td>15</td>
</tr>
</tbody>
</table>

* Attrition refers to the loss to follow-up at final assessment. As some authors presented percentages without decimal points, those articles providing data with decimal points were rounded to maintain consistency across studies.


83
Table 2.11 Family management interventions for cannabis use – Treatment condition comparisons

<table>
<thead>
<tr>
<th>Articles</th>
<th>Between-group comparison</th>
<th>Included measures</th>
<th>Condition with significantly greater outcome and the measures showing a significant between-condition difference</th>
<th>Treatment effect size d (95% CI) at final FU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number of sessions : condition</td>
<td></td>
<td>Treatment end</td>
<td>Short FU</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------</td>
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<td>-----------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>16:MDFT (47)</td>
<td>16:AGT (53)</td>
<td>a,e,f</td>
<td>[1] a, e (acting out)</td>
<td></td>
</tr>
<tr>
<td>Liddle et al. (2001)⁴⁴⁸</td>
<td>16:MEI (52)</td>
<td></td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16:MDFT (47)</td>
<td>[2] a, e (acting out)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Waldron et al. (2001)⁴⁴⁹     | 12:FFT (30)              | a,f,e             | -                                             | [1] a, f                  | [1] f                    | -                        | 0.3 (-0.2 – 0.8)* (
|                              | 12:CBT (31)              |                  | -                                             |                          |                          |                          | 0.7 (0.2 – 1.2)* (
|                              | 24:CBT+FFT (29)          |                  | -                                             |                          |                          |                          | 0.1 (-0.4 – 0.6)* (
|                              | 12:CBT (31)              |                  | -                                             |                          |                          |                          | 0.4 (-0.1 – 0.9)* (
|                              | 12:FFT (30)              |                  | -                                             |                          |                          |                          | 0.5 (0.0 – 1.1)*             |
| Latimer et al. (2003)³³³     | 48:IFCBT (21)            | a,c,e,g           | [1] a,g                                       |                          | [1] a,g                   |                          | -                                             |
|                              | 16:DHPE (22)             |                  | [1] a,e (problem solving, parental communication) |                          | g                        |                          | 0.8 (0.1 – 1.4)               |
| Dennis et al. (2004)³⁵⁰      | 5:MET+CBT (102)          | a,d,e,g           | ns                                            | ns                       | ns                       | ns                       | ns                              |
|                              | 12:MET+CBT (96)          |                  | ns                                            | ns                       | ns                       | ns                       | ns                              |
|                              | 15:FSN (100)             |                  | ns                                            | ns                       | ns                       | ns                       | ns                              |
|                              | 15:FSN (100)             |                  | ns                                            | ns                       | ns                       | ns                       | ns                              |
| Kamon et al. (2005)³⁶¹       | 14:CBT+FT+CM (19)        | Baseline data a,e,g | [1] a, e (internalising / externalising, parental monitoring & discipline) |                          |                          |                          | Inadequate data provided       |
Table 2.11 (Cont.) Family management interventions for cannabis use – Treatment condition comparisons

<table>
<thead>
<tr>
<th>Articles</th>
<th>Between-group comparison</th>
<th>Included measures</th>
<th>Condition with significantly greater outcome and the measures showing a significant between-condition difference</th>
<th>Treatment effect size d (95% CI) at final FU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14:MET+CBT &amp; 12:FE+CMad. (33)</td>
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<td></td>
<td>ns</td>
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<tr>
<td></td>
<td></td>
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<td>[1]</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt; 0.10***</td>
</tr>
<tr>
<td>Liddle et al. (2004/09)•332,</td>
<td>16:MDFT (39)</td>
<td>a,d,e,f,g</td>
<td>[1] a, e (family cohesion, peer interactions, academic issues), f, g</td>
<td>0.1 (-0.3 – 0.5)¥</td>
</tr>
<tr>
<td>467</td>
<td>16:PGT (41)</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>[1] a, e (family cohesion, academic issues, delinquent behaviours), f, g</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>[1] a, e (family cohesion, academic issues, delinquent behaviours), f, g</td>
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</table>

Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “-” symbol is used in the case where an article did not include a follow-up assessment within one of these periods. The condition which achieved the more positive treatment outcome (for example, a greater reduction in cannabis use or improvement in well-being) is presented in square brackets (either [1], or [2]) along with the symbols for each measure (a - g) where a statistically significant between-condition difference was noted. If no significant between-condition difference was noted at p<0.05 on any included measure, “ns” denotes the non-significance. Unless otherwise stated, the treatment effect sizes were based on change in days of cannabis use (mean and standard deviation) from baseline to final follow-up. * Waldron et al. did not provide the sample size for each intervention condition at final follow-up. ** Dennis et al. provided an overall effect size (Cohen’s f) and reported no between condition differences. No confidence interval was reported. *** Stanger et al. provided the reported effect size without a confidence interval ¥ This effect size was calculated on information provided by Liddle et al. regarding the use of “any substance” in the past 30 days.


Treatment Outcomes “a” cannabis using days, “b” quantity per day, “c” cannabis dependence severity, “d” cannabis-related problems, “e” psychological wellbeing, “f” meaningful change, “g” other drug use.
Table 2.12 Family management interventions for cannabis use – Cannabis use outcomes

<table>
<thead>
<tr>
<th>Articles</th>
<th>Treatment number of sessions : intervention (N)</th>
<th>Collateral measures used to check fidelity</th>
<th>A = Days of use (%) Treatment end</th>
<th>B = Point-prevalence abstinence (%) Treatment end</th>
<th>Significant predictors of cannabis use frequency at final follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Short FU</td>
<td>Medium FU</td>
<td>Long FU</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Liddle et al. (2001)(^{346})</td>
<td>16:MDFT (47)</td>
<td>Urine, parent Session recording &amp; feedback</td>
<td>16:</td>
<td>MDFT (47)</td>
<td>47</td>
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<tr>
<td></td>
<td>16:AGT (53)</td>
<td></td>
<td>16:</td>
<td>MEI 52)</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>16:MEI 52)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waldron et al. (2001)(^{349})</td>
<td>12:FFT (30)</td>
<td>Urine, parent Session recording &amp; feedback</td>
<td>24:</td>
<td>CBT+FFT (29)</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>12:CBT (31)</td>
<td></td>
<td>8:</td>
<td>TAC</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>24:CBT+FFT (29)</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Latimer et al. (2003)(^{333})</td>
<td>48:IFCBT (21)</td>
<td>Urine, parent Session recording &amp; feedback</td>
<td>16:</td>
<td>DHPE (22)</td>
<td>22</td>
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<td></td>
<td>16:DHPE (22)</td>
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<tr>
<td>Dennis et al. (2004)(^{350})</td>
<td>5:MET+CBT (202)</td>
<td>Urine, parent Session recording &amp; feedback</td>
<td>22:</td>
<td>MDFT (102)</td>
<td>102</td>
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<td></td>
<td>12:MET+CBT (96)</td>
<td></td>
<td>10:</td>
<td>ACRA (100)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>22:MDFT (102)</td>
<td></td>
<td>15:</td>
<td>FSN (100)</td>
<td>100</td>
</tr>
<tr>
<td>Kamon et al. (2005)(^{361})</td>
<td>14:CBT+FT+CM (19)</td>
<td>Urine, parent None</td>
<td>14:</td>
<td>CBT+FT+CM (19)</td>
<td>19</td>
</tr>
<tr>
<td>Stanger et al. (2009)(^{337})</td>
<td>14:MET+CBT &amp; 12:FM+CMab. (36)</td>
<td>Urine</td>
<td>14:</td>
<td>MET+CBT &amp; 12:FE+CMab. (33)</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>12:FM+CMab. (36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:MET+CBT &amp; 12:FE+CMab. (33)</td>
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</tbody>
</table>
Table 2.12 (Cont.) Family management interventions for cannabis use – Cannabis use outcomes

<table>
<thead>
<tr>
<th>Articles</th>
<th>Treatment number of sessions : intervention (N)</th>
<th>Collateral Measures used to check fidelity</th>
<th>A = Days of use (%)&lt;sup&gt;a&lt;/sup&gt;</th>
<th>B = Point-prevalence abstinence (%)&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Significant predictors of cannabis use frequency at final follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment end</td>
<td></td>
<td>Treatment end</td>
<td>Short FU</td>
<td>Medium FU</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Liddle et al.</td>
<td>16-AGT (53)</td>
<td>None</td>
<td>Session</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>(2004/09)&lt;sup&gt;467&lt;/sup&gt;</td>
<td>16-MDFT (39)</td>
<td>recording &amp; feedback</td>
<td>21*</td>
<td>36&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>16-PGT (41)</td>
<td></td>
<td>75*</td>
<td>33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Short FU refers to follow-up assessments conducted between 1 to 4 months (typically 3 months) from baseline or treatment end. Medium FU refers to follow-up assessments conducted between 5 to 11 months (typically 6 months) from baseline or treatment end. Long FU refers to follow-up assessments conducted at least 12 months from baseline or treatment end. In the case where an article reported multiple follow-up assessments within one of these periods, data from the assessment representing the longest duration from baseline or treatment end was selected for this table. The “-” symbol is used in the case where an article did not include a follow-up assessment within one of these periods. The “?” symbol is used to denote those cases where the required data was not reported by the article. As some authors presented percentages without decimal points, all data is presented with decimal points rounded to maintain consistency across studies.

<sup>a</sup> Unless otherwise specified, the percentage of cannabis using days refers to the past 90 days; * per cent abstinent days in past month; ^ per cent abstinent days in past week

<sup>b</sup> Abstinence is reported as using on <10% of days or “minimal use”

<sup>c</sup> Percentages refer to using cannabis less than once per week,

<sup>d</sup> This figure is taken from a graph presented with treatment conditions collapsed as there was no significant between-group differences were identified

<sup>e</sup> This figure was provided by graph in the relevant article and so was estimated for the purposes of this table


87
Cannabis use interventions based on acceptance and commitment therapy

To date only one trial has investigated the utility of acceptance and commitment therapy (ACT) as a basis for a cannabis use intervention. In this initial investigation, Twohig et al. recruited three individuals (one female and two males) with CUD (aged 43, 19 and 20 years). The participants’ cannabis use was monitored daily using marks on index cards, and validated with oral swab at pre-treatment, post-treatment and three month follow-up. The ACT intervention consisted of eight weekly sessions of 90 minutes. All three participants had stopped using cannabis at post treatment (confirmed by oral analysis that could only reliably test for use in the past three days). By three months two of the three participants had relapsed to cannabis use, albeit at a reduced level compared to baseline (a reduction of two bowls per day, and six inhalations per day, respectively). These reductions did not appear to be associated with reductions in depression, anxiety, or withdrawal symptoms (as measured by the Beck Anxiety Inventory, the Beck Depression Inventory-II, and the Marijuana Withdrawal Checklist). The extremely limited sample of three participants meant that no statistical comparisons could be made; however, the findings warrant a well-controlled trial with a no-treatment control condition and a larger sample size to allow statistical comparisons between groups.

Cannabis use interventions based on aversion therapy

To date only two uncontrolled trials have investigated the utility of aversion therapy as a basis for a cannabis use intervention (not including an initial pilot trial of 20 substance users, two of whom used cannabis and reported abstinence at six month follow-up). The first of these trials was conducted by Morakinyo in Nigeria. A total of nine adult male hospital patients with a psychotic illness and history of cannabis abuse (aged between 18 and 26 years) were recruited to receive the aversion therapy. In
particular, the participants were photographed when re-enacting the process of preparing a cannabis joint and were later exposed to emetine hydrochloride and brine (causing an emetic action and retching) while studying these photographs of the preparation and imaging themselves in this situation. This therapy was administered on three separate occasions over three to four days. Although there is little detail on the follow-up methodology, the participants were reported to be abstinent from six to 14 months (with an average of nine months) through outpatient observations. No further information regarding the participant characteristics was reported.

Although not a controlled trial, the second study was conducted five years later in the US. In this trial, 22 adults (73% male, with a mean age of 29.8 years) were recruited through newspaper advertisement. Aversion therapy consisted of five daily treatments of an “uncomfortable but not painful” shock treatment delivered randomly as the participant was asked to smoke a THC-free ‘joint’. In addition, the participants were asked to record their own relapse prevention techniques in between the treatment sessions. Finally, seven of the 22 participants reported urges to use cannabis following the aversion therapy and were invited to attend three additional weekly sessions of group discussion regarding their individual solutions to maintaining abstinence. Along with a measure of cognitive functioning, the frequency of cannabis smoking (joints per day) was then recorded by telephone interview at six and 12 months post-treatment. The participants self-reported an abstinent rate of 75% at six months and 84% at 12 months (three participants were smoking cannabis at 12 months, one of whom did not report a reduction in smoking frequency). Interestingly cognitive functioning was also seen to improve, although the sample size prevented any meaningful statistical comparisons.
Although these two trials did not include the same quality in trial procedures and treatment outcome assessment as the other trials discussed in this chapter, the rates of abstinence reported in long term follow-up assessments were promising. Unfortunately, further study is required to control for confounding factors (such as other substance use, motivation to reduce use, and levels of co-morbid disorders) and for any potential access to additional treatment during the follow-up periods. As with the use of ACT as a basis for cannabis intervention, aversion therapy warrants a larger controlled trial to allow for statistical between group comparisons.

PHARMACOTHERAPIES TO ASSIST CANNABIS USE INTERVENTIONS

To date, 13 trials have tested the utility of pharmaceutical products on humans in assisting with cannabis use reductions. These products may assist with reductions by attenuating the experience of withdrawal, or attenuating the perception of reward from using cannabis. Those products that have been tested include: Nefazadone, Bupropion, Lithium Carbonate, Escitalopram, Divalproex sodium, synthetic forms of THC administered at levels below threshold for intoxication (oral THC and Dronabinol), the combination of oral THC and lofexedine, the combination of Nefazodone and Bupropion, Atomoxetine, Buspirone, and Rimonabant. Seven of these trials utilised a placebo control, four of which also included double blind comparisons. One trial did not include a control group, but compared treatment dropouts with those who completed the treatment. These trials represent early investigations of these pharmaceutical products and typically recruited a sample of less than 30 participants, with the larger trials recruiting 50, 63, 106 and 156 participants.
In addition, at the time of writing, the National Cannabis Prevention and Information Centre (NCPIC) in Australia was conducting phase two of a double-blinded placebo controlled trial to evaluate the effectiveness of combining treatment as usual with Sativex (a cannabinoid medicine delivered by buccal spray that consists of a standardized combination of cannabinoids including an almost equal amount of THC as CBD). This trial follows from the success of the medication in treating pain and spasticity among patients with multiple sclerosis.470-472 A contributing factor to the potential of the medication is the CBD component – a cannabinoid known to have anti-psychotic and anxiolytic properties,59 and a moderating effect on some of the psychoactive effects of THC.60-63

In regards to using pharmacological interventions with the primary aim of reducing cannabis use, the largest clinical trial to date utilised Dronabinol (oral THC) and was conducted recently by Levin et al. (2011).389 The authors recruited 156 participants from newspaper advertisements and randomly allocated them to receive either: 1) biweekly doses of placebo for one week, nine weeks of medication (two capsules, twice daily for a maximum dose of 20 mg), followed by two weeks of placebo (n=79); or 2) biweekly doses of placebo for 12 weeks (n=77). In addition, all participants received nine weekly sessions of a MET+CBT-based intervention coupled with abstinence-oriented CM (with maximum earning at $570). Follow up data was collected at each clinic visit for 63.5% of participants, with urinalysis validating self-report. An intention-to-treat analysis was utilised given the large amount of data missing to follow-up and depicted no statistically significant difference between treatment groups regarding the reductions in cannabis use frequency. Notably, Dronabinol did statistically significantly increase treatment compliance and reduce the experience of withdrawal. Unfortunately, no detail was provided regarding the sensitivity analysis that was conducted and the methods of data
imputation in the intention-to-treat analysis was not described. As such, interpretation of these findings should be done with caution, particularly given the risk of bias toward positive outcomes as a result of the reported high attrition.\textsuperscript{473}

Additional research, however, has shown that low doses of Dronabinol (10mg) reduces the experience of withdrawal in a subset of the full spectrum of withdrawal symptoms (including the common experience of difficulty sleeping, and the less commonly reported symptoms of feelings of anxiety, misery, and chills),\textsuperscript{383} and higher doses (30 mg) have been shown to prevent withdrawal completely.\textsuperscript{382} This body of research has been summarised by three review articles of the pharmacotherapy studies conducted to date.\textsuperscript{299, 329, 393} Only the findings regarding oral THC, or Dronabinol were described to have shown promise.\textsuperscript{299, 329, 393}

\textbf{A comment on pharmacotherapy for cannabis use reductions}

In summary, with the exception of the trial described regarding the use of Dronabinol,\textsuperscript{389} studies on oral THC only have been carried out in small, homogenous, and non-treatment seeking samples.\textsuperscript{381, 382, 385} Notably, the combination of pharmacotherapy and behavioural counselling has been shown to be desirable to cannabis users and achievable by practitioners.\textsuperscript{385, 389} Alongside the particular promise of oral THC in human studies, a growing literature of animal studies has shown success of an antagonist medication named Rimonabant in rats, monkeys and pigeons.\textsuperscript{391} One trial of this product has been conducted on 63 males in a placebo controlled trial to determine if the drug could block the subjective effects of cannabis use.\textsuperscript{388} This trial demonstrated significant blockade of the effects of use as depicted by self-report on visual-analogue scales and was suggestive that future work utilising the medication alongside behavioural treatments may demonstrate improved treatment outcomes.
compared to behavioural treatment alone.\textsuperscript{391} With the somewhat promising results depicted by these small trials on pharmacotherapy, further testing is warranted. Given the lack of large randomised controlled trials with varied samples of cannabis users, no particular pharmacotherapy has been supported for mainstream use.

CANNABIS USE INTERVENTIONS – WHICH IS THE “BEST”?\textsuperscript{474}

Comparisons between trials of cannabis use interventions regarding treatment outcomes are difficult. A vast number of different measures used between trials confound accurate comparison. That is, the same level of real-world improvement may be detected as a statistically significant change on one sensitive measure but fail to reach significance on a broader measure of the same construct. As such, a comparison between such measures can lead to false-negative or false-positive outcomes. Further, the cannabis use intervention trials conducted also vary greatly in the timing and length of follow-up assessment, participant treatment adherence, and loss to follow-up. For these reasons a meta-analysis is not possible.

In 1995, the clinical psychology division of the American Psychological Association published a document detailing a standard means to define a particular intervention as “well-established” or “probably efficacious”.\textsuperscript{474} This document was subsequently updated in 1998,\textsuperscript{475} and a list of empirically-supported treatments is provided online which has been funded to be regularly updated “indefinitely”.\textsuperscript{476} According to the most recent document,\textsuperscript{475} a well-established intervention must include either: 1) at least two large between-group design studies (which have a treatment manual, specify the characteristics of clients and are conducted by different investigating teams) demonstrating a statistically significant improvement in treatment outcomes compared to unassisted control or equivalent treatment outcomes compared to an already
established treatment; or 2) At least ten single-case design experiments of good experimental design which compare an intervention (which have a treatment manual, specify the characteristics of clients, and are conducted by different investigating teams) to another treatment and demonstrate efficacy. Alternatively, a probably efficacious treatment must demonstrate either: 1) two experiments showing a statistically significantly superior treatment to a wait-list control group; or 2) at least one experiment is statistically superior to a placebo or another established treatment, and this experiment has a treatment manual and depicts the characteristics of the participants clearly; or 3) at least four single-case design experiments that meet the criteria for a well-established treatment.

According to these guidelines, only the combined MET+CBT intervention is ‘probably efficacious’, and bordering on achieving a ‘well-established’ status. That is, although two large studies by independent researchers have been conducted (the Cannabis Youth Treatment study,\textsuperscript{350} and the Marijuana Treatment Project\textsuperscript{345}), these studies recruited populations of disparate age groups (adolescents and adults). In addition, a series of four experimental trials\textsuperscript{338,345,353,354} have demonstrated the efficacy of MET+CBT-based treatments compared to alternative treatments (where at least ten experiments are required).

**A word of caution regarding cannabis use interventions**

Although MET+CBT-based interventions represent a probably efficacious cannabis use treatment among adults, there is still much room for improvement. That is, when observing point-prevalence abstinence rates between interventions at long term follow-up, there is little difference between conditions. To illustrate this point, Table 2.13
shows the results of studies reporting the average percentage of cannabis using days among participants at 12 months.

Table 2.13 Percentage of cannabis using days by intervention participants at 12-month follow-up

<table>
<thead>
<tr>
<th>Counselling style</th>
<th>No. of trialled cannabis interventions</th>
<th>Pooled no. of participants</th>
<th>Average percentage of cannabis using days at 12 months (range)</th>
<th>Minimum %</th>
<th>Maximum %</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI-, or MET</td>
<td>3</td>
<td>422</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBT</td>
<td>3</td>
<td>227</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MET+CBT</td>
<td>4</td>
<td>462</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MET+CBT+CM</td>
<td>2</td>
<td>107</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Therapy</td>
<td>6</td>
<td>372</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: the percentage of cannabis using days reported is a summary of results from trials which referred to a period ranging from the past 30 to 90 days

Assuming weekly cannabis use would present an average percentage of cannabis using days at 14% (one in seven days), it is clear that despite the intervention received, participants were using cannabis more than weekly on average at 12 months. Naturally, for those seeking treatment to abstain, a more desirable outcome would be little to no use at 12 months. Yet this remains unlikely considering that approximately 70% of those achieving abstinence following outpatient cannabis treatment are likely to relapse to cannabis use by six months post treatment.477

Perhaps a more relevant outcome to real-world change following treatment is that of attaining clinically significant improvement.478 Several definitions of clinically significant improvement have been presented.160, 345, 347-349, 354, 467 These definitions vary greatly, but each refer to a reduction in cannabis use and/or symptoms of cannabis use disorder (CUD). Notably, no definition of improvement refers to quality of life, or mental health. The various definitions are described here, along with the percentage of intervention participants who reported improvement in the trials citing the respective definitions:
- 50% reduction or no report of symptoms of CUD at three months post-treatment (45% of intervention participants improved).  

- Point-prevalence abstinence or 50% reduction from baseline and no report of symptoms of CUD at three, six, or 12 months post-treatment (35-61% of intervention participants improved).  

- Past 90-day abstinence or no report of symptoms of CUD at four or nine months post-treatment (6-10% of intervention participants improved).  

- Treatment completion and past 14-day abstinence at treatment end (21-46% of intervention participants improved).  

- Smoking less than three days per week with no other substance use and a Grade Point Average of greater than 2.0 (among adolescent students) at treatment-end or 12 months post-treatment (42-45% of intervention participants improved).  

- Smoking less than 10% of days at four or seven months post-treatment (55-88% of intervention participants improved).  

- Smoking at a frequency similar to the general community as reported by the Monitoring the Future survey at 12 months post-treatment (7% of trial participants used illicit drugs compared to 8.5% of participants in the survey).  

This variability stands in contrast to definitions of improvement established for other mental health disorders which refer to falling within a range of functioning comparable to that of a functional or normal population. Currently, a lack of norms for what normal functioning might entail among cannabis users make this definition of improvement inappropriate in the field of cannabis use treatment. However, regardless of definition, most participants do not achieve abstinence from cannabis, or clinical improvement, following treatment.
So, is there a “best” way to deliver a MET+CBT intervention?

It is not clear how to most appropriately deliver a MET+CBT intervention or to whom the intervention would be most appropriate.402 Across studies, the MET+CBT interventions have been trialled utilising two,347 four,338 five,350 eight,354 nine,341, 345, 355 10,356 12,350 and 14353 session designs. Of these trials, two made a direct comparison between two MET+CBT-based interventions delivered with a different number of sessions,350, 355 one trial compared the same MET+CBT-based intervention when delivered with different duration,338 and two investigated the effect of treatment adherence to a nine and 10 session MET+CBT-based intervention on reductions in cannabis use.356, 446

The first of these trials reported no statistically significant difference in treatment outcomes between a five session (with two individual and three group sessions) and a 12 session MET+CBT-based intervention (where the 12 session intervention incorporated an additional seven group delivered sessions to the five session condition).350 The second trial compared participants attending a nine session MET+CBT-based intervention with a group of participants who attended a four session intervention followed by an optional number of additional MET+CBT-based intervention sessions as was felt needed (up to 13 sessions).355 This trial found that those attending an optional one to two sessions, or six to 13 sessions, reported statistically significantly fewer cannabis using days up to 28 months compared to the nine session intervention.355 The third trial compared a four session MET+CBT-based intervention delivered over one month with the same intervention delivered over three months. No statistically significant difference in treatment outcomes was noted between these conditions at four months from baseline regarding cannabis use frequency or
quantity, or related problems. One exception was that participants receiving the three-month intervention reported statistically significant reduction in symptoms of cannabis dependence compared to those receiving the intervention over one month. Finally, although a non-significant trend was noted, the final two trials investigating treatment adherence to a nine and 10 session MET+CBT-based intervention failed to show a statistically significant difference in the number of abstinent days reported by participants who completed treatment and those with minimal attendance.\textsuperscript{356, 446}

In addition, MET+CBT-based cannabis use interventions are yet to be trialled utilising a sample of participants consisting of less than 68% males, or among participants with an average age of less than 21 years, or more than 36 years. Further, no such trial has reported any characteristics of the participant which significantly predicted variance in treatment outcome (such as baseline cannabis use, pre-treatment self-efficacy, age, gender, or education). As such, to whom this intervention is most appropriately delivered also remains unclear.

Given the variance between these studies there is no clear or consistent evidence to suggest how many sessions of MET+CBT is the most appropriate. As such, a low intensity and brief MET+CBT intervention warrants further investigation as this intervention may produce comparable outcomes to a more resource intensive intervention without using the additional resources required. By the same token, a high intensity intervention of long duration also warrants investigation. That is, the cannabis intervention trials described in this chapter are typically less than 12 sessions. It may be that substantial improvements to cannabis use and overall functioning are more likely to be achieved by individuals attending interventions with a greater number of sessions and longer duration than that which has been researched. Thus, the increased frequency
of improvements reported may support the cost effectiveness of these more resource intensive interventions.

**REAL-WORLD IMPLEMENTATION OF CANNABIS USE TREATMENTS**

The cannabis use interventions described in this chapter are not widely disseminated throughout real-world treatment practices. In part, this is due to the absence of a standard gold star intervention with low complexity, high internal validity and adoptability. Moreover, assuming a gold star intervention is attained, there is currently no general implementation strategy to encourage its use.\[^{480}\]

Another factor inhibiting cannabis use intervention dissemination is that the available trials typically investigate treatment efficacy and recruit participants in a highly selective manner.\[^{481}\] This may contribute to an incompatibility of the interventions with dependent cannabis users in the community. Okuda et al.\[^{481}\] found that 80% of cannabis dependent individuals represented by the US National Epidemiologic Survey on Alcohol and Related Conditions would not be found eligible to participate according to at least one exclusion criteria used across cannabis intervention trials. The individual criterion responsible for excluding the greatest proportion of potential clients were: legal problems, other illicit drug use disorders, and current use of fewer than five joints per week.\[^{481}\] Once a cannabis intervention is found to be efficacious, however, further study without these restrictions on participation is warranted to establish the intervention as *effective* (feasible in real-world settings).\[^{482}\]

In an ideal world with a gold standard intervention, the gap between research and implementation must then be reduced. Two plausible approaches include: 1) improving dissemination (exploring the ways to inform the relevant parties of new interventions and how to best integrate or deliver them); and 2) improving implementation (ensuring
that integration is successful and ongoing). Three recently explored wide-reaching delivery mechanisms may show promise in promoting a greater dissemination of cannabis use intervention: conventional mail, the internet, and the telephone.

**Delivering a cannabis use intervention by conventional mail**

An initial uncontrolled trial of a mail-delivered cannabis use intervention was reported by Norberg et al. in 2011. These authors screened 268 participants and, post screening, allocated 149 participants to the intervention. Of those participants, 63 dropped out prior to baseline assessment; often stating a desire for a more immediate treatment. Thus, 86 participants (56% males, a mean of 37 years) completed the baseline assessment. This assessment, followed by the intervention, and two follow-up assessments conducted on the telephone at treatment-end and at one month post-treatment, were all posted to participants in hardcopy. The intervention consisted of six modules posted fortnightly based on CBT and MI principles with personalised feedback on responses to the baseline assessment and the first, third and last intervention module. Less than half of participants completed the six modules (42%).

Overall, those participants who completed the modules reported a statistically significant decrease from baseline to treatment-end in frequency of cannabis use, and quantity of cannabis used on a typical day. In addition, treatment completers reported a statistically significant decrease in quantity of use at one month post-treatment, and approximately one-quarter of treatment completers \( n=8; 22\% \) reported no cannabis use in the two weeks prior to this assessment. Unfortunately, from the 149 eligible participants recruited into this study, 36 completed treatment resulting in a completion rate of 24%. Moreover, those completing treatment were then resistant to follow-up
assessments and data regarding severity of cannabis dependence and related problems was not collected.

The significant rates of treatment attrition and general resistance from participants did not support the efficacy of delivering a cannabis intervention by conventional mail. Given the reported strengths of this intervention delivery model (minimised need for counsellor contact, and reported reductions in cannabis use), it is possible that a mail-delivered cannabis intervention could be efficacious, however, future work will need to specifically address the high rates of treatment attrition in a large randomised controlled trial.

**Delivering a cannabis use intervention via computer**

The majority of research on computer-based substance use prevention treatments have targeted alcohol and tobacco use.\(^\text{489,490}\) To date, three trials of a computer-based cannabis use intervention have been conducted in Australia, all within the last three years.\(^\text{485-487}\) Of these trials, two were cannabis specific interventions,\(^\text{486,487}\) and one included a component which attended to cannabis use among other substance use.\(^\text{485}\)

The first of the computer-based cannabis specific trials was conducted by Budney et al., in the US, in 2011.\(^\text{487}\) These authors compared a computer delivered MET+CBT+CM-based intervention with minimal counsellor support to a similar intervention delivered entirely by counsellors.\(^\text{487}\) These authors recruited a total of 38 participants (53% male, with a mean age of 33 years) from newspaper advertisements and allocated participants to intervention groups in a non-random fashion dictated by the counsellor’s case load and time needed to develop the computer intervention. The computer program was delivered over 12 weeks in nine sessions (sessions were 24 minutes on average) including interactive exercises such as a cost-benefit analysis of quitting cannabis use.
A counsellor offered support over three of these sessions (for total of 47 minutes). This computer intensive condition was compared to a group of participants receiving nine MET+CBT-based sessions (ranging from 45 to 90 minutes for a total of 482 minutes) delivered by a counsellor over 12 weeks. Both groups received abstinence-oriented CM (vouchers worth up to $435 with continuous abstinence) following each intervention session. No statistically significant between-group differences were noted regarding frequency of cannabis use, or related problems, or the participants’ self-efficacy over the 12-week treatment period. This lack of difference between-conditions may have reflected a lack of statistical power due to the small sample size. Regardless, given that this computer-based intervention achieved comparable treatment outcomes to a more resource intensive counsellor delivered intervention, this initial trial supported the feasibility of further research into computer-based cannabis interventions.

The second computer-based cannabis use intervention was conducted by Tossman et al. in Germany, also in 2011. These authors recruited 1,292 treatment-seeking individuals over two years from individuals accessing a substance use website (www.drugcom.de/?id=quittheshit) and randomly allocated them to receive either: 1) weekly online feedback from counsellors regarding cannabis use levels delivered over 50 days ($n=360$; with 503 participants dropping out due to a lack of interest in the intervention after registering a motivation to cease cannabis use with the website); or 2) a delayed treatment control condition ($n=429$; DTC). Follow up data was collected at three months post treatment from 206 participants (16% of the recruited participants). The final sample (71% male, with a mean age of 25 years) was dramatically reduced after participants discontinued the intervention early ($n=686$) or were lost to follow-up ($n=495$). Despite the high attrition, a power analysis showed that small to medium between-group effects could be detected with 80% power at an alpha-level of 5%. In
addition, the authors used probability weights to account for the bias introduced by the large drop out. At final follow up, participants in the intervention group who completed all assessment interviews reported the use of cannabis statistically significantly less frequently and at less quantity in the past 30 days, compared to those in the control group. Thus, despite the large rates of drop-out, a number of cannabis users were reached and assisted to reduce their use with minimal resources.

The remaining computer-based trial was designed to assist individuals to reduce alcohol and cannabis use, and/or co-morbid depression. A total of 97 participants (46% male, with a mean age of 36 years) were recruited from referrals from health-care settings and were randomly allocated to receive: 1) a brief single-session intervention on depressive symptoms and substance misuse; 2) the same brief intervention followed by nine weekly sessions of a MI+CBT-based computer-delivered intervention with minimal counsellor support (10-15 minutes per session); or 3) the same brief intervention followed by a nine session MI+CBT-based counsellor-delivered intervention. Follow-up data was collected at three, six, and 12 months (with 16% loss to follow-up).

The participants receiving either the computer-delivered, or counsellor-delivered, intervention reported comparable reductions in levels of depression and greater reductions in cannabis and alcohol use frequency compared to the control intervention. No statistically significant differences were noted between the computer- and counsellor-delivered interventions among treatment completers. A secondary analysis using an intention-to-treat approach (last observation carried forward) suggested that reductions in cannabis use frequency were significantly greater for the computer-delivered intervention condition.
The promising results from these trials suffer from some limitations. First, a large number of participants were lost to follow up, even when in a relatively captive environment (school classrooms). Unfortunately, those individuals who discontinued the intervention may have done so in the belief that treatment may not work for them and be less motivated to reduce their use. In addition, the intention-to-treat approaches used to account for missing data can not completely correct for this problem. As such, as with mail-based interventions, future work should address the high treatment attrition rates before this form of intervention delivery could be considered efficacious. Second, without proper protection protocols the nature of computer-based trials may prevent ensuring anonymity to participants. That is, participants may be required to register with an email address which could be published elsewhere on the internet, or use a computer that is accessible by other individuals. Third, as with most face-to-face cannabis interventions, little is known about the specific mechanisms of change that relate to the computer interventions. That is, no statistically significant differences in treatment outcome have been reported regarding the provision of normative feedback, availability of a discussion feature, inclusion of entertainment features, emphasis on relapse prevention, or in the number of treatment sessions that are completed.

Recent research has supported the use of computer-based interventions for general substance use specifically when these interventions include encouragement by a counsellor, and instruction on the use of the intervention program. Although the research on cannabis-specific computer-based interventions is clearly in its infancy, the trials described here are consistent with this research and support the potential of an internet delivery mechanism for reaching a large cannabis using audience and assisting them to reduce use.
Delivering a cannabis use intervention by telephone

A single study has investigated the feasibility of delivering a cannabis use intervention by telephone. These authors recruited 1,744 adult participants (74% male, with a mean age of 25 years) from callers to a Brazilian cannabis-specific helpline over 21 months and randomly allocated them to receive either: 1) a single 20 minute MET+CBT-based session and self-help materials ($n=873$); or 2) a control group which received only the self-help materials ($n=871$). Follow-up data was collected at eight time points over a six month period. A large loss to follow-up was reported with less than half (47%) of participants completing the first follow-up assessment at one day from baseline and less than one third (30%) completing the follow-up at six months. The first 262 individuals from each group to complete the six month follow-up assessment were selected for analysis.

The authors reported that 73% of the intervention and 59% of the control group had ceased using cannabis at six months. Restated, intervention participants were 160% more likely to report abstinence at six months ($95\% \ CI=120-200\%$). Female participants were reportedly twice as likely to achieve abstinence compared to males, particularly if they were motivated to reduce their use at baseline assessment. This finding stands in contrast to the only other trial of a cannabis use intervention to report a gender difference in treatment outcomes where greater outcomes were more frequently reported by males than females following ten sessions of a CBT-based face-to-face intervention.  

This initial study reported promising results but suffered from severe methodological limitations. Firstly, 38% of participants were attending self-help meetings or were receiving concurrent pharmacological treatment during the trial. This may have
influenced the outcomes reported and were not controlled for in the analysis reported by the authors. Secondly, the authors did not report any treatment fidelity information and it was not clear if the counsellors adhered to training and delivered the intervention as intended or if the self-help materials were used by participants. This was potentially a problem as the counsellors delivering the intervention were reportedly not professional drug or alcohol telephone counsellors, but college students. The counsellors were, however, trained to deliver the intervention over five days (for a total of 40 hours) and were required to complete a written test. Those who obtained a certain score were recruited and required to complete an additional 15 days of training of an unreported duration per day. Thirdly, as described the loss to follow-up was very high. Notably, the authors did not detail any attempt to control for this in their analysis and failed to report if there were statistically significant differences between treatment completers and those lost to follow-up. Thus, the final sample may be biased toward greater reductions as it was likely to be comprised mainly of only the most determined participants. Fourthly, the results were limited to the proportion of participants reporting abstinence from cannabis and did not include measure of changes in frequency or quantity of cannabis use, cannabis dependence, or associated problems at follow-up assessments. Moreover, the reported ‘abstinence’ was not defined.

Despite these limitations, this telephone delivered cannabis use intervention reported a very high percentage of abstinent participants at the six month follow-up assessment (73% of intervention and 59% of control participants). In fact, even the control condition who made one call to the helpline reported a higher frequency of abstinence at six months than any other cannabis use intervention reviewed in this chapter (the next highest was reported by participants who received an eight session MET+CBT-based intervention, where 54% of participants reported abstinence at six months). As such,
this trial supported the utility of the telephone in delivering a cannabis use intervention to assist a large and sparsely located audience of treatment seekers.

WHERE TO FROM HERE?

The mail, internet and telephone have each shown some potential in the short to medium term to act as a mechanism to deliver a cannabis use intervention to a widespread audience of treatment seekers. However, the research regarding each of these mediums is in its infancy with only a handful of trials conducted to date.

In particular, additional research is required which includes: treatment fidelity assessments, control for concurrent treatments, a comprehensive assessment of cannabis use and related problems, methods to decrease rates of drop-out, and a measure of outcome predictors including participant self-efficacy. Given the particularly promising results of the sole telephone intervention, it is of interest to determine if such promise is maintained when trialled under these conditions. Further, this delivery mechanism is preferred by most tobacco smokers compared to face-to-face services when offered the choice, and this finding may generalise to cannabis smoking. As such, the primary aim of the present thesis is to develop and evaluate a brief cannabis treatment that is delivered by telephone.

Thesis overview

In order to provide an effective telephone-based cannabis use intervention it was noted that a review of telephone-based communications technologies and their place in the substance use field was required. Such a review would highlight any effective components to telephone-based interventions for substance use and assist in building a strong foundation for the development of a new telephone-based cannabis use
intervention. As such, Chapter Three details an extensive literature review of telephone-based substance use interventions.

Further, such an intervention would be best delivered using an existing service. In this way, the expense of establishing a functioning helpline could be minimised. In Australia a single national helpline targets individuals with cannabis-related concerns – the Cannabis Information and Helpline (CIH). Thus, it was of interest to determine if this helpline was positioned in such a way that it could offer cannabis use treatment seekers an efficacious telephone delivered cannabis intervention. As such, the first three research questions of the present thesis were asked to establish the extent to which the CIH receives calls from individuals requesting assistance in reducing their cannabis use and to detail the helpline’s responses to these concerns. These three questions were:

1) How does the CIH operate and who staffs the CIH?
2) Who calls the CIH and why do they call?
3) What happens during a call to the CIH?

To address these first three research questions concerning the positioning of the CIH, two sources of information were utilised: consultation with CIH senior staff, and a database kept by CIH staff with information from each call. This information is described in Chapter Four and is hereby referred to as Study One, or the ‘process evaluation’.

It was also of interest to determine how well the service was received by its callers and if there were any aspects of the existing service that could inform the development of a cannabis telephone-based intervention. As such, three further research questions concerned the impact of the call:

1) Are the callers to the CIH satisfied with their call?
2) Are callers given any information, advice and/or referral that they use?

3) Are there any aspects of the call, or the caller, that may predict satisfaction with the call?

To address these further research questions, a telephone interview was conducted with 200 callers to the CIH. This interview was conducted one week following the individual’s call to the CIH to allow time for the caller to receive any materials sent to them by mail or to follow through on any given referrals or advice. This study is described in Chapter Five and is hereby referred to as Study Two, or the ‘impact evaluation’.

The information garnered from the cannabis interventions reviewed in this chapter, the literature review detailed in the next chapter, and the process and impact evaluation of the CIH, was used to inform the development of a four session telephone intervention. This intervention, namely, the Cannabis Assistance HelpLine (hereby referred to as the CAHL intervention), was modelled on the Adolescent Cannabis Check-up and a brief CBT-based treatment for cannabis dependence. As such, the intervention was guided by two counselling approaches: motivational interviewing and cognitive behavioural therapy including the tenants of relapse prevention. The development of the CAHL intervention, as well as the training process for CIH staff to implement the intervention, is described in Chapter Six.

Finally, in order to ensure that the CAHL intervention was useful to individuals interested in reducing their cannabis use, the utility of the intervention required evaluation. As such, the present thesis addressed two final research questions:
1) Does the CAHL intervention lead to a reduction in cannabis use and/or related problems, or lead to an improvement in overall well-being when compared to those not receiving the intervention?

2) What predicts treatment outcomes and do any treatment gains remain while controlling for additional external support?

To address these final two research questions, a randomised controlled trial (RCT) was conducted to compare the CAHL intervention with a group of participants allocated to a delayed treatment control condition. The methods for this RCT are described in Chapter Six, while the results from this trial are discussed in Chapter Seven. This trial is hereby referred to as Study Three, or ‘Project CAHL’. Finally, an overview and discussion of the findings from this thesis as a whole, along with recommendations for future research, are described in Chapter Eight.
CHAPTER THREE: TELECOMMUNICATIONS FOR SUBSTANCE USE CONCERNS

OVERVIEW

This chapter details a review of literature regarding the use of the telephone in the delivery of substance use treatment. The historical use of the telephone is discussed, as well as its evolution to present day telecommunication technologies including telemedicine, telepsychiatry, interactive voice response technology and smartphone and mobile applications. The most common application of telecommunication technologies in regards to substance use treatments, however, is telephone counselling. As such, this chapter details a systematic review of the available research on telephone counselling, paying particular attention to its application in tobacco cessation, which has been the principal focus of this research to date. In addition, the scant research regarding telephone counselling for alcohol and other drug related concerns is summarised and discussed. The chapter concludes with an overall discussion of the available literature and how it relates to the primary aims of the thesis to develop and evaluate a telephone-based cannabis use intervention.

TELECOMMUNICATION TECHNOLOGIES IN HEALTHCARE

In Australia, over one hundred telephone counselling services operate despite a lack of evidence regarding their effectiveness, or any regulatory body to establish a code of conduct. Australia’s first telephone service, Lifeline, was established by Reverend Dr Sir Alan Walker following a call from a distressed man who subsequently completed suicide in 1963. Lifeline was conceived as a service providing immediate and inexpensive crisis intervention via telephone. Since this time, Lifeline has evolved to
provide a national service offering generalist support for people in need, answering over 1250 calls per day, and on average 50 of these callers are at high risk of suicide. In 2002, a review of non-profit Australian telephone counselling services was conducted by Urbis (then Urbis Keys Young). The review identified 171 different services in operation, targeting over 15 different topics or issues (such as sexual abuse, depression, men and women’s health and drug use). Advances in communications technology have resulted in a rapid expansion in the number of telephone counselling services available, and the development of new services, including videoconferencing, interactive voice response telephones, and smartphone applications. In fact, the telecommunications industry has brought about entire industries of service in medical health care and psychiatry, referred to as telemedicine and telepsychiatry, respectively. Telephone counselling, telemedicine and telepsychiatry services (hereby collectively referred to as helplines) have received different levels of academic interest, ranging from a dearth of information regarding telephone counselling to a relative breadth of research in telemedicine.

There is no governmental national coordinating organization of helplines and no established definition of the different applications of telecommunications technology. Despite this, the use of telecommunication technologies has been researched in many different types of health care, ranging from mental health (particularly for depression, anxiety and eating disorders) and physical health concerns (particularly for hypertension, disease management and heart disease) to substance use concerns (particularly for tobacco) and gambling related problems. As this thesis is concerned with the provision of substance use treatment, the description relating to each of the main forms of telecommunications is limited to their application to substance use treatments.
Telemedicine

Telemedicine (sometimes referred to as ‘telehealth’) is in a developmental stage in Australia, but has a great foundation of international research highlighted in multiple reviews of the literature. Despite this, no universal definition of the term “telemedicine” has been accepted. The literature commonly conceives of telemedicine as the provision of healthcare across a distance, typically via video conferencing. According to a 2003 national survey of 814 Australian hospitals, approximately half were utilising telemedicine applications (particularly those hospitals in the public sector compared to the private sector; 62% compared to 14%). This expansion in telemedicine could be a boon for the relatively underserved communities, such as rural, remote, non-English speaking, and indigenous communities.

In Australia, telemedicine typically relates to the provision of non-intensive medical care or education (such as triage, or consultation and follow-up) and does not yet provide a complete treatment service involving feedback and case management. The telemedicine literature consistently regards the technology as an effective delivery system of non-intensive medical care, but question remains if it is a cost-effective alternative. Further, telemedicine has not yet been evaluated for the provision of substance use treatment.

Telepsychiatry

Telepsychiatry (sometimes referred to as ‘telecare’) was founded in the early 1970s and has been the subject of multiple literature reviews. Like telemedicine, no universal definition of the term “telepsychiatry” has been accepted. The literature commonly conceives of telepsychiatry as a specialty of telemedicine that provides psychiatric services across a distance, typically via video conferencing.
Telepsychiatry services are most commonly applied to the provision of mental health consultations and assessments by interviewing and observing patients via video conferencing, and discussing diagnoses and treatment plans.\textsuperscript{512, 517} The telepsychiatry literature indicates that these consultations and assessments are regarded as reliable and lead to accurate diagnosis of mental health concerns, but questions remain regarding client satisfaction and cost effectiveness.\textsuperscript{520} As with telemedicine, the use of telepsychiatry has not been rigorously evaluated for the provision of substance use treatment.

**Interactive voice response technology**

Interactive voice response (IVR) technology (sometimes referred to as ‘touch tone’ phone systems) refers to an automated telephone line that has been designed to make calls using recorded speech, or receive calls by recording speech or by responding to key presses.\textsuperscript{521} The healthcare industry has utilised IVR technology for over thirty years.\textsuperscript{521} In this time, IVR technology has been adapted to facilitate the provision of information and reminder calls, monitoring of patient symptom progress, recording of self-assessments, dissemination of messages with pre-recorded motivational interviewing sessions, and the completion of surveys.\textsuperscript{521}

In the field of substance use, IVR technology typically has been utilised as a means to screen for drug use patterns (sometimes referred to as ecological momentary assessment).\textsuperscript{522-533} Participants in these studies use the IVR technology to maintain a substance use dairy that is updated daily by using a touch-tone phone to record the amount of a substance used. Literature regarding the use of IVR technology to assist with substance use reductions is particularly limited, and to date, the results from just
two such interventions have been published (with one intervention detailed in two articles).\textsuperscript{534-536} These two interventions are discussed briefly here.

In the first trial of a substance use IVR intervention program, 390 pregnant women were assisted in their attempts to reduce tobacco smoking.\textsuperscript{534} The trial randomised participants to receive either: an optional IVR service combined with a self-help booklet ($n=133$); a self-help booklet on its own ($n=131$); or a self-help booklet along with four to six, 10-15 minute motivational interviewing telephone counselling sessions ($n=126$). The IVR service was designed to provide customised advice (appropriate to the participants’ motivation to change) in the form of recorded messages delivered following voluntary interaction from the participant using a touch-tone phone. Follow-up data was obtained from 285 women (85\% of the sample) in the 32\textsuperscript{nd} week of pregnancy and, overall, 20\% of participants had stopped using tobacco (confirmed by biochemical validation). Two further observations from the trial results were of note.

First, there were no statistically significant differences found between the three participant groups in cessation rates.\textsuperscript{534} Second, the participants appeared to favour the self-help materials as those randomised to receive the IVR intervention did not commonly make use of the service, opting to read the booklet instead (only 21\% of participants called the service).

The second trial of an IVR-based tobacco use intervention was conducted almost ten years later.\textsuperscript{39,40} This study evaluated the effectiveness of an IVR service that was linked with internet support, text messaging, and optional nicotine replacement therapy (NRT), compared to a control group receiving a self-help booklet and the optional NRT.\textsuperscript{535,536} The IVR service was available over 54 weeks and participants received pre-recorded relapse prevention messages that were tailored to the participants’ level of use as
indicated by touch-tone phone. At 12 month follow-up, the intervention showed efficacy over the self-help booklet in terms of abstinence rates (an intention-to-treat analysis showed that 22% of the intervention, compared to 13% of the control group, reported abstinence across all follow-up assessments). A second paper reported on results from the same intervention selecting participants who did not use the optional NRTs and showed comparable results. As tobacco interventions reporting abstinence rates over 10% at 12-month follow-up are considered effective over self-quitting attempts, the IVR technology did show promise in assisting individuals to reduce tobacco use in both trials, however, the supportive research was limited. That is, the more recent trial did not assess IVR technology on its own, but was rather a combination of different media (internet, written and telephone). Also, the cessation rates resulting from the self-help materials could be considered effective treatment in both trials. Further, these materials were actually favoured by participants over the use of the IVR technology. Finally, given the length of the IVR intervention trial that showed treatment gains (over 54 weeks), the cost effectiveness over brief counselling interventions is unknown. As such, further research is needed regarding the use and cost effectiveness of IVR technology compared to an alternative form of intervention (including self-help materials and counselling) as it applies to assisting individuals to reduce alcohol or other drug use.

**Mobile phone and smartphone applications**

The use of smartphones is the most recent advancement in telecommunications to be adapted to substance use treatments. The release of the iPhone in 2007 allowed third parties to develop interactive software applications (or “apps”), with over 100,000 applications available two years later. Two articles have reviewed the available
licit substance related apps,\textsuperscript{540, 541} and two further articles have reviewed literature regarding the use of text messaging services.\textsuperscript{542, 543}

The two systematic reviews of the smartphone applications available through the iTunes\textsuperscript{©} store, identified 47 apps relating to tobacco smoking cessation (as of 2009),\textsuperscript{540} and 222 apps relating to alcohol use cessation (as of 2010).\textsuperscript{541} Both the tobacco and alcohol review articles evaluated the apps as they applied to the provision of substance use treatment against principals of “best practice”. The tobacco cessation apps were found to be mostly calendar-related and operated by tracking days prior to, and after, a nominated quit date. As such, these applications did not contain any counselling content and did not rate highly against best practice. In contrast, the alcohol use cessation apps typically were rated to be empirically based, or potentially effective, based on four principals of effective treatments (that is, 90\% of apps contained: motivational enhancement therapy, cognitive therapies, coping/self-control training, or social skills and/or social support training). Unfortunately, no evaluation of the app intervention effects on substance use reductions have been published to date.

Smartphones, and other mobile phones, have the capacity for delivering a second recent form of substance use intervention - motivational text messaging. In the most recent systematic review of motivational text messaging interventions by Free et al.,\textsuperscript{542} 131 trials were identified, of which five trials focused on substance use (all tobacco smoking cessation interventions). The authors of this recent review also conducted a randomised controlled trial of text messaging for smoking cessation. This trial was designed to improve upon the previous trials, by utilising a six month follow-up assessment and an intention-to-treat analysis strategy. A total of 5800 smokers (with a mean age of 37 years and an approximately even gender split) were recruited by media advertisement
over two years and randomly allocated to receive personalised cessation advice delivered by 186 text messages (from a database of 713 text messages; \( n=2911 \)), or to receive a minimal intervention (basic text messages regarding trial participation, e.g. “Thanks for taking part!”; \( n=2881 \)). The cessation rates reported by the intervention group were statistically significantly greater than that of the control group, as reported at the six month follow-up assessment (self-reported 28-day abstinence of 20% compared to 14%, with biochemically validated continuous abstinence at 11% compared to 5%).

The utility of messaging services regarding illicit substance use treatment has been investigated in two trials. An initial trial examined the utility of providing an aftercare messaging service to individuals returning home from residential treatment for co-occurring substance use problems and psychiatric illness. Participants were eight patients, and eight staff members, and the participants were encouraged to use a mobile phone provided to message staff for support when needed. In total, 210 messages were sent by the participants during the intervention. Qualitative interviews were conducted regarding the use of the messaging service and the service was rated favourably overall. The patients felt connected and enjoyed being able to send and receive messages in times of need.

The subsequent trial investigated the use of informational and motivational messaging to assist with cannabis use reductions. A group of 12 participants was chosen from a pool of users that were provided with access to informational messaging (40 messages were sent per participant over 21 days) and to motivational messaging (68 messages were sent over 36 days). Qualitative interviews showed that the participants valued the simplicity of the informational messages, their specificity to their personal situation, and
their straightforwardness. Participants did not rate the motivational messaging as positively, and criticised the mode of approach and content of the messages. Overall, the motivational messaging service was not generally thought to be sufficient to elicit reductions in use for heavy users. The extent to which the motivational messages were associated with reductions in substance use was not described in either trial.

This body of work has demonstrated a considerable capacity for the use of mobile telephones to assist people with substance use reduction, with hundreds of apps available for managing substance use reductions and some early promise shown by informational mobile messaging services. However, these telecommunication technologies are yet to be evaluated by randomised controlled trials (RCTs) with comparisons made between telephone interventions and alternative treatment control groups. In addition, the long term implications of these interventions are unknown as the available trials typically do not extend follow-up assessments beyond six months. Notably, a single trial has reported outcomes at 12-month follow-up supporting the efficacy of an IVR intervention compared to self-help control group.39,40

In comparison to the four communications technologies described above, telephone counselling has a more established history of research investigating treatment outcomes, and is the most commonly utilised medium of long-distance technology for delivering clinical services.546 As such, a greater focus is afforded to telephone counselling here, particularly as it applies to substance use treatment.

**Telephone counselling**

Telephone counselling (or ‘telecounselling’) in Australia originally was conceived as a form of crisis intervention.498 This perception was maintained by the bulk of literature over the last 40 years;547 beginning in the 1970s548 and continuing through the 1980s549
and the 1990s. As the research continued, the potential for helplines to move beyond crisis intervention was realised, and the perception of telephone counselling services changed to be that of a general support for vulnerable people. As highlighted in the only review of Australian telephone counselling services, as of 2002, few services operated beyond state boundaries (14%), and most staff were trained formally (81%) and renumerated for their time (82%). Callers typically used the services more than once (59%) and were often referred to mental health services for additional support (68%).

There are two broad types of telephone counselling services, with three different subcategories. Telephone counselling services are either proactive (answer and initiate calls to clients) or reactive (answer but do not initiate calls). The subcategories of services refer to those that: 1) offer their services to the community at large (generally operating round the clock); 2) offer services to a specific group (typically operating outside of business hours, but are not ‘24 hour’ services); or 3) operate as an adjunct to a health or welfare agency (operating in normal business hours). Although these types and subcategories of telephone counselling services have been defined, a universal definition of telephone counselling has not been recognised, and these services operate in Australia without a regulatory body. The research regarding the adaptation of telephone counselling services to substance use treatment is described here.

**TELEPHONE COUNSELLING FOR SUBSTANCE USE TREATMENT**

Prior to the last decade, there was a dearth of research regarding telephone counselling services, with no RCTs having been conducted on the efficacy of telephone counselling services that were not adjuncts to a health or welfare agency. Notably, even the most
targeted issue by Australian helplines - sexual assault - has not been researched with the exception of a handful of descriptive articles profiling callers to these services in Italy, and India. The bulk of research was regarding adjunct services designed to assist individuals with tobacco cessation, and to a lesser extent, to alleviate mental health disorders (typically depression) or diet and fitness concerns.

To date the literature concerning the utility of telephone counselling services to assist in reducing illicit substance use has not been systematically reviewed. The lack of literature regarding telephone counselling services in illicit substance use has been commented on in a non-peer-reviewed summary of Victorian-based drug and alcohol telephone counselling services conducted by the Turning Point Drug and Alcohol Centre:

“Anecdotally one of the things that has worked against telephone services is its origins in the volunteer industry and the community good will orientation… it has not had the focus or attention in terms of credibility or evidence base and it has been allowed to ride the currents of anecdotal evidence that what appears supportive or appropriate actually leads to better health outcomes, vis-á-vis knowledge, attitudinal or behavioural changes. Because of its feel good nature some of the impetus for asking research questions has been reduced, particularly in the environment of multiple models of service delivery and an absence of benchmark service standards.”

In other words, the relative absence of research into telephone counselling compared to face-to-face counselling is explained partially by a reduced motivation for completing evaluative research due to an overarching opinion that telephone counselling is \textit{prima facie} a valuable clinical tool. Although the research regarding telephone counselling is
scarce, the information available does speak to the pros and cons of the technology in general, and more specifically in the delivery of substance abuse treatment.

The benefits of telephone counselling in substance use treatment

*Telephone counselling can be confidential and non-threatening*

Individuals utilising a telephone counselling service may feel their personal space is less threatened, and feel that the session itself is less intensive, compared to approaching a professional in their own office (with any associated receptionists, waiting rooms, or dress codes). Further, the treatment seeker is able to preserve anonymity (with the possible exception of voice recognition). This may be especially beneficial to an individual seeking cannabis treatment as there is less stigma associated with telephone counselling than when entering substance use treatment in person, and there is no need to co-habit with other drug users – two of the main barriers reported by individuals seeking cannabis treatment.

*Telephone counselling has no fixed location of service*

For individuals wishing to enter treatment of any kind, the location is an important factor, particularly for individuals living in remote areas or those also poorly serviced by public transport. When the treatment is delivered by telephone, the location is no longer important (assuming a global telephone mobile coverage). Individuals in a remote location or with a physical disability are not required to travel, and treatment seekers do not need to remain in a fixed location during treatment; allowing for full-time work, or a change of address.
Telephone counselling can be accessible and flexible

Motivation to enter substance use treatment can be fleeting and easily attenuated by access problems – a barrier that is addressed by telephone counselling services with wide operation hours. The accessibility of telephone counselling services may be of additional benefit to individuals requiring assistance at the time of a craving or relapse to drug use. In addition, telephone counselling sessions can be further manipulated to be delivered at other times of greater need such as before and after attempts to reduce substance use (or ‘quit dates’). Finally, if operating as an adjunct to another service, telephone counselling can reduce attrition during treatment by providing additional follow up sessions, or by bridging sessions between face-to-face visits.

Telephone counselling gives the caller power

The nature of telephone counselling treatment delivery is such that the caller is empowered to end treatment sessions at any time by hanging up the phone – a fact that may result in a more forthright and honest treatment session. Additionally, the health professional is unable to impose a sense of authority through the presence of such things as certificates on their office wall, or a desk to sit behind, and the caller may feel more comfortable in their own personal environment.

Telephone counselling encourages good healthcare practice

As visual cues are absent in the treatment session, the health professional is encouraged to improve their speaking communication, and improve upon active listening and responding skills such as reflecting, summarizing, paraphrasing – elements that are key to effective counselling. Further, telephone counselling lends itself to making referrals to additional treatments - an important aspect of any substance use treatment
given the widespread ignorance of available treatments. Finally, telephone
counselling may be beneficial on a larger scale just by existing and thus promoting the
perception that there is a level of harm associated with the targeted substance.

The draw backs of telephone counselling as substance use treatment

Limitations of the technology

Although the accessibility of telephone counselling is thought to be a benefit of
telecommunications technology, not all telephone counselling services have the
infrastructure to meet the demands of its operation. In the 2002 review of Australian
telephone counselling services, 62-90% of calls to over 131 agencies were unanswered
due to under resourcing, or due to failures in telecommunication infrastructure to
manage capacity. In other words, for every two calls answered by telephone
counselling services, one person would have tried and failed repeatedly (after an
average of 3.95 calls to engage with the service). However, this concern is specific to
the telecommunication provider and the resources available to the telephone counselling
service.

The applicability of telephone counselling services also is limited, with services
typically excluding the deaf or speech impaired and under serving groups that may be
less likely to use telephone services, such as younger black males, or blue-collar
workers. Notably, a common complaint of Australian helplines, even among those
with no hearing impairment, relates to problems with hearing clearly. Finally,
although many helplines operate as state-based services, or even national services, they
do not usually reach more than approximately 1-5% of their target audience without
advertising. However, when considering the frequency of individuals with
substance use concerns in Australia (approximately 3% of the population), assisting
even 1-5% of those with a substance use disorder may be considered a success as this refers to approximately 15,000 Australians (assuming all of those who call a helpline receive assistance), or approximately one tenth of the face-to-face treatment seeking population. Further, mass media campaigns have been shown to statistically significantly increase call rates to tobacco cessation helplines, and could assist to increase the reach of other substance use helplines.

**Telephone counselling can be tiring and difficult**

Counsellors will each have different expectations and skill sets regarding telephone counselling and the restrictions imposed by the lack of visual clues. Some may find the lack of visual cues difficult, and dislike the reduction in the number of exercises that can be included (such as using a whiteboard, book or audio/visual tool or being able to interpret the use of non-visual cues). Further, depending on agency capacity, staff may complain of “compassion fatigue” after answering several calls in a single shift without the benefit of feedback on intervention outcomes, or opportunity to debrief between calls. This may be common as in Australia over half (57%) of telephone counselling services receive over 100 calls per week, and 13% receive over 500 calls per week.

**Research regarding telephone counselling is problematic**

The gaps in the evidence-base concerning best practice delivery of telephone counselling services in health are well recognised. Two major issues have been identified. First, telephone counselling services are often not aware of the research or may not perceive it to be useful. Specifically, evaluation research is often not published or difficult to find in the literature, or could be seen as academic. Second, the research suffers from methodological issues such as a lack of funding leading to small sample
sizes, a need to breach a caller’s assumed anonymity, possible conflicts of interest between evaluators and helpline staff, and most research is typically not grounded in theory or supported by validated measures. These issues partially explain the scarcity of research regarding telephone counselling services and highlight a need for improvements in future research. Consequently, implementation of a telephone counselling service into the field of substance use often suffers from a lack of knowledge regarding supportive research and the associated absence of recommendations on how to improve upon existing services.

The advantages inherent in telephone counselling services imply that these services could offer an effective delivery method for substance abuse treatment, but the described drawbacks also suggest caution. Thus, to provide a clearer picture of the efficacy of utilising telephone counselling to assist individuals with a substance use concern, the scant literature is reviewed here. As the majority of telephone counselling research concerns tobacco cessation, this topic is reviewed first.

**Telephone counselling for tobacco cessation**

The literature regarding telephone counselling for tobacco cessation is so abundant that it has warranted several systematic meta-analytic literature reviews that span over two decades. The first of these reviews was conducted in 1966 by Lichtenstein et al. This initial meta-analytic review investigated the literature relating to reactive tobacco helplines before evaluating the efficacy of the available trials of telephone-based tobacco use interventions. A total of 13 intervention trials were included in the meta-analysis, representing the trials available that included a randomised design. The number of sessions/calls in these trials ranged from one to nine, and included trials that provided both a short- (three to eight month) and long-term (12-18 month) follow-up
assessments. Trials with differing control groups were combined and there was no exploration of their methodological quality or the content of the interventions. Despite the variation between the included trials, the authors concluded that telephone counselling statistically significantly increased point prevalence abstinence rates over control by an average odds ratio of 1.3 (95% CI=1.2-1.5) at short term follow up. Results were less promising at long term follow up (greater than six months) where the average odds ratio maintained significance, but was reduced to 1.2 (95% CI=1.1-1.4).550

Following Lichtenstien et al.’s initial meta-analysis, eight further review articles have included pooled estimates of the effectiveness of telephone counselling in assisting individuals to reduce tobacco use.374, 557, 593, 594, 596, 597, 599, 600 The results from these articles are summarised in Table 3.1 which demonstrates a moderate but consistent effectiveness of telephone counselling over control in trials published prior to 2010. This table is only meant to provide an approximate guide to the general effectiveness of telephone counselling as the methodological quality of the included trials, how abstinence was measured (point prevalence or continuous), and the detail regarding the control groups were not adequately discussed in the review articles.

One exception is the most recent meta-analysis published in 2011 by Tzelepis et al.600 This article assessed the influence of the methodological quality of the included trials, the recruitment channel of the trial participants, and the choice of treatment outcome measures, on the effect of interventions. The methodological quality of the reviewed trials was measured using the validated Quality Assessment Tool for Quantitative Studies.601 Recruitment channel referred to whether participants were recruited from individuals using health services (reactive recruitment) or from media advertisements such as radio, newspaper or magazine adverts (proactive recruitment). The treatment
outcomes that were assessed included both continuous and point prevalence abstinence, with telephone counselling being compared to self-help material or no intervention control groups.

Overall, no effect for telephone counselling was found at long term follow-up (at least 12 months) regardless of the recruitment channel, trial methodological quality or choice of treatment outcome. However, in the short term (six to nine month follow-up), the findings supported telephone counselling by demonstrating statistically significant efficacy over control. Results from a single trial suggested that participants who were proactively recruited reported better outcomes in the short term due to this group’s lower severity of dependence compared to reactively recruited participants. In addition, although half of the included trials of lower methodological quality reported statistically significantly greater short term continuous abstinence than trials of higher quality, no difference was seen in terms of point prevalence abstinence. The paper concluded that telephone counselling appears most promising in the short term, however, further research is still needed regarding trials utilising reactive recruitment strategies, and the importance of accounting for the methodological quality in these trials was highlighted.
Table 3.1 Summary of pooled odds ratios of telephone counselling compared to control as presented in previous meta-analyses of tobacco use interventions

<table>
<thead>
<tr>
<th>Author</th>
<th>Included trial publication range (by year)</th>
<th>Number of included trials</th>
<th>Follow-up range of included trials (in months)</th>
<th>Pooled odds ratio</th>
<th>95% CI</th>
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<td>1.1 - 1.4</td>
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<td>1-34</td>
<td>2.6*</td>
<td>-</td>
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<td>3-34</td>
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</tr>
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<td>1991 – 2009</td>
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<td>6-18</td>
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<td>1.29</td>
<td>1.20 - 1.38</td>
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<td>1.27 - 1.57</td>
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<td>6-12</td>
<td>1.39</td>
<td>1.24 - 1.56</td>
</tr>
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<td>&lt; 2009</td>
<td>4</td>
<td>6</td>
<td>13.0**</td>
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<td>24.5**</td>
<td>-</td>
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<tr>
<td>Ebbert et al.</td>
<td>1995 – 2009</td>
<td>9#</td>
<td>6-12</td>
<td>2.24</td>
<td>1.89 - 2.66</td>
</tr>
<tr>
<td>Tzelepis et al.</td>
<td>&lt; 2009</td>
<td>24</td>
<td>6-9</td>
<td>1.26</td>
<td>1.11 - 1.43</td>
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<td>1.08</td>
<td>0.99 - 1.19</td>
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<td>1.35</td>
<td>1.02 - 1.80</td>
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<td>1.22</td>
<td>1.08 - 1.38</td>
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<td></td>
<td></td>
<td>16</td>
<td>ns^1</td>
</tr>
<tr>
<td>Ebbert et al.</td>
<td>1996 – 2006</td>
<td>16b</td>
<td>6-9</td>
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</table>

* This evaluation did not report an odds ratio, but reported a median percentage point change in rates of cessation of 2.6 (the range of percentage point change in the trials evaluated was -3.4 to +23)

** This evaluation reported an absolute risk reduction 13.0% and 24.5% instead of a pooled odds ratio, and included only Chinese interventions delivered by nurses

a These trials were limited to those which recruited participants from individuals who had initiated contact with a helpline (reactive recruitment)

b These trials involved recruitment through media advertisements (proactive recruitment)

^ These trials involved the “less intensive arm” from interventions regarding stepped care models

# This evaluation was of ‘smokeless’ or chewing tobacco (orally consumed)

^ The odds ratio was not reported in the review article due to the non-significance of intervention effect
Telephone counselling for tobacco cessation – literature update

The meta-analyses discussed above were limited to trials published prior to late 2009. To provide a more up to date view on the literature available regarding telephone counselling for tobacco cessation, a systematic review was conducted including studies published outside of the scope of the most recent review article (i.e. late 2009 to present). Studies were identified in a three step process. First, a title key word search for each of: “telephone counselling”, “telepsychiatry”, “telephone intervention”, “telecounselling”, and “helpline” was conducted on “Google Scholar” and “Ovid”. Second, a title search was utilised among these articles to determine if the article had a focus on tobacco use. Third, reference listing from the included literature was scanned to identify further articles of interest. The first step identified a total of 2289 articles. Following the second and third steps, however, this sample was reduced to 17 papers of interest. The selected articles fell into three categories: 1) two uncontrolled trials of telephone counselling services; 2) 10 controlled trials of telephone counselling services; and 3) five descriptive papers regarding telephone counselling services. The five descriptive papers were regarding: referral rates to tobacco use telephone counselling services by pharmacists, the barriers relating to African American women in using tobacco helplines, a description profiling callers to an Italian tobacco helpline, a description of a pharmacist run tobacco helpline for elderly smokers, and a summary detailing the methods of a yet to be conducted randomised controlled trial of a telephone counselling intervention for smoking parents. These papers contributed to the understanding of telephone counselling for tobacco use by demonstrating its versatility to be used in various health-care settings, and in non-
English speaking countries,\textsuperscript{614} but that the counsellors’ cultural competencies regarding the targeted communities is pivotal to satisfaction with telephone counselling tobacco use interventions.\textsuperscript{613}

The 12 most recent trials of tobacco telephone interventions are summarised in Table 3.2. The trial recruitment strategy, as well as the number, gender and age of participants and details of the trialled intervention along with the reported outcomes are detailed. The included trials most commonly recruited participants reactively (from callers to helplines),\textsuperscript{604, 605, 608, 609, 612, 617, 618} though five interventions recruited participants proactively (using advertisements).\textsuperscript{605, 602, 603, 607, 608} The trials generally included participants of mixed genders, who were over 30 years of age. One exception was a trial of an intervention conducted with high-school students.\textsuperscript{607} The outcomes measured were point-prevalence abstinence,\textsuperscript{505, 602-604, 606-609, 612, 617} cost-effectiveness,\textsuperscript{610, 611} and/or other factors relating to satisfaction with the intervention.\textsuperscript{603, 605}
Table 3.2 Trials regarding telephone counselling for tobacco cessation

<table>
<thead>
<tr>
<th>Article</th>
<th>‘n’ at first / last follow up</th>
<th>Age (M)</th>
<th>Sex</th>
<th>Recruitment procedure</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tzelepis et al. (2011)</td>
<td>1562 / 1245</td>
<td>≈ 45 years</td>
<td>Mixed</td>
<td>“Cold calls” were made through the use of the NSW Electronic White Pages telephone directory inviting individuals to participate in the RCT (proactive recruitment)</td>
<td>(1) Telephone counselling intervention of up to 12 sessions depending on motivation to quit (2)self-help material control</td>
<td>13</td>
<td>7-day point prevalence abstinence, quit attempts, and 50% reduction rates</td>
<td>No significant differences between groups at 13 months although abstinence outcomes significantly favoured intervention at 4 and 7 months</td>
</tr>
<tr>
<td>Graham et al. (2011)</td>
<td>1905 / 1031 #</td>
<td>36 years</td>
<td>Mixed</td>
<td>Advertised link to web based intervention sent through to web users who entered a search term of ‘quitting’ ‘stopping’ or ‘smoking’ (reactive recruitment)</td>
<td>(1) enhanced internet intervention (2) enhanced internet and telephone counselling support intervention (3) basic internet intervention only control</td>
<td>18</td>
<td>30 day point prevalence abstinence,</td>
<td>No significant differences between groups at 18 months, outcome favoured telephone supported intervention at 3, 6, and 12 months</td>
</tr>
<tr>
<td>Andoh et al. (2009)</td>
<td>990/990#</td>
<td>* -  * -</td>
<td>* -</td>
<td>Callers to a national reactive smoking helpline were screened for interest in intervention (reactive recruitment)</td>
<td>(1) Access to reactive telephone service intervention (2) Self-help booklet control</td>
<td>12</td>
<td>Analysis of predictors of abstinence</td>
<td>No intervention effect. Annual household income, confidence in quitting and self efficacy scores predicted abstinence at 1,3,6 and 12 mos.</td>
</tr>
<tr>
<td>Hebert (2011)</td>
<td>92/74</td>
<td>46 years</td>
<td>Female (67%)</td>
<td>Callers to the California Quitline were invited to participate after screening to include callers with current depression (reactive recruitment)</td>
<td>(1) telephone intervention with mood management (up to 15 sessions – typically 114 minutes total was received) (2) telephone intervention without mood management (up to 5 sessions - typically 53 minutes total was received)</td>
<td>3</td>
<td>Likert scale score on confidence in quit plan, Percentage quit for 7 days, PHQ-8 (depression and health questionnaire)</td>
<td>More participants of the enhanced intervention rated quit plan 10 out of 10, and percentage quit for 7 days (29.4% vs. 17.5%). No significant difference in PHQ-8 score change.</td>
</tr>
<tr>
<td>Article</td>
<td>‘n’ at first / last follow up</td>
<td>Age (M)</td>
<td>Sex</td>
<td>Recruitment procedure</td>
<td>Participant groups</td>
<td>Follow up period in months</td>
<td>Main measures</td>
<td>Outcomes</td>
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<tr>
<td>Peterson et al.</td>
<td>2151/1911</td>
<td>17 years</td>
<td>Mixed</td>
<td>Classroom survey identifying smokers given to all students in 25 schools and non-smokers in 25 control schools (proactive recruitment)</td>
<td>(1) telephone intervention for daily smokers (average of 2.83 calls) and less than daily smokers (average of 1.18 calls) (2) pair matched control (no intervention)</td>
<td>12</td>
<td>Point-prevalence abstinence, 30 day smoking frequency, number of quit attempts, readiness to quit score</td>
<td>Daily smoker intervention showed significantly greater abstinence outcomes at 7-day, 1-mos, 3-mos., duration since last smoke, 30 day freq. &amp; smokes per day. No intervention effect in less-than-daily smokers.</td>
</tr>
<tr>
<td>Patten et al.</td>
<td>59/59# (pairs of users and carers)</td>
<td>≈36 years</td>
<td>Female (92%)</td>
<td>Flyers sent to the community targeting family members or friends of smokers and smokers (proactive recruitment)</td>
<td>(1) Self-help booklet plus 5 weekly telephone counselling sessions (2) Self-help booklet control</td>
<td>6, 26 (weeks)</td>
<td>22-item measure on Support Provided; smokes per day; quitting self-efficacy; abstinence rates with biochemical validation</td>
<td>No intervention effects on smoking rates or quit attempts over control. 71% of support persons indicated the intervention was somewhat or very helpful</td>
</tr>
<tr>
<td>Van der Meer et al.</td>
<td>485/372#</td>
<td>44 years</td>
<td>Female (77%)</td>
<td>Callers to the Dutch national Quitline service were screened for interest in the trial (reactive recruitment)</td>
<td>(1) Telephone counselling sessions over 3 months (average of 6 calls received) (2) mood management intervention consisting of self-help booklet, CBT sessions targeting depression with average of 8 telephone counselling sessions</td>
<td>6,12</td>
<td>7-day point prevalence abstinence</td>
<td>Intervention showed significant gains on all abstinence measures over control. 6-mos odds ratio 1.6 (1.1-2.4); 12 mos. odds ratio 2.0 (1.2-3.1); 7-day point prevalence 1.4 (0.9-2.0) at 6 mos. and 1.2(0.8-1.9) at 12 mos.</td>
</tr>
</tbody>
</table>
Table 3.2 (cont.) Trials regarding telephone contacts in tobacco cessation

<table>
<thead>
<tr>
<th>Article</th>
<th>‘n’ at first / last follow up</th>
<th>Age (M)</th>
<th>Sex</th>
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<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segan &amp; Borland (2011)²⁴¹</td>
<td>1444/409</td>
<td>37 years</td>
<td>Mixed</td>
<td>Callers to Victorian Quitline service were randomised to receive extended call back counselling following a quit attempt, or the Quitline standard service (reactive recruitment)</td>
<td>(1) telephone counselling of typically 7 calls (1 call prior to, and 6 calls following a quit attempt) (2) usual care of typically 5 calls (1 call prior to, and 4 calls following a quit attempt)</td>
<td>12</td>
<td>Continuous abstinence, cost per quitter, per year in AUS, ratings regarding craving</td>
<td>No difference between groups of continuous abstinence (both approximately 26% quit). Cost per quitter was $11,202</td>
</tr>
<tr>
<td>Smith et al. (2011)²⁴⁰</td>
<td>838/819#</td>
<td>57 years</td>
<td>Male (90%)</td>
<td>Primary care veteran patients who smoked, were recruited from one of five health care facilities into an RCT (reactive recruitment)</td>
<td>(1) ‘TELESTOP’ program of 7 calls over two months, plus additional follow up call(s) if participants had questions regarding medication side-effects (2) usual care at a health-care facility</td>
<td>12</td>
<td>Cost per quitter, per year in AUS</td>
<td>Difference in cost per quit rates between telephone care and standard care were non-significant. Cost per quit was likely to be less than $11,000, and the 95%CI was within a range considered cost effective (i.e. &lt;$10,000)</td>
</tr>
<tr>
<td>Bricker et al. (2010)²⁴³</td>
<td>14/14#</td>
<td>49 years</td>
<td>Male (57%)</td>
<td>Participants recruited from media advertisements (proactive recruitment)</td>
<td>(1) an average of 3.5 calls based on acceptance and commitment therapy were completed of approximately 25 minutes each</td>
<td>12</td>
<td>Satisfaction with intervention, acceptance of cravings, commitment to quitting, and abstinence</td>
<td>Vast majority felt respected and that the intervention helped. Acceptance increased five-fold and commitment by twenty times, 29% achieved abstinence</td>
</tr>
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</table>
Table 3.2 (cont.) Trials regarding telephone contacts in tobacco cessation

<table>
<thead>
<tr>
<th>Article</th>
<th>‘n’ at first / last follow up</th>
<th>Age (M)</th>
<th>Sex</th>
<th>Recruitment procedure</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quintiliani et al. (2010)</td>
<td>227/64</td>
<td>49 years</td>
<td>Male (100%)</td>
<td>Participants were approached from 8 truck terminals for transport workers (proactive recruitment)</td>
<td>(1) Five calls based on MI and a ‘social context model’ for weight control and tobacco use</td>
<td>10</td>
<td>Point-prevalence 7-day abstinence, measured self-efficacy on 4-point Likert-type scale</td>
<td>75% abstinent although no relation to number of calls completed. Perception of the “fit” of call number and goal setting/meeting predicted abstinence</td>
</tr>
<tr>
<td>Sood et al. (2009)</td>
<td>999/521</td>
<td>43 years</td>
<td>Female (63%)</td>
<td>Participants were randomised into groups upon calling a tobacco helpline (reactive recruitment)</td>
<td>(1) Reactive helpline so use was determined by callers and was not reported in this trial (2) Self-help material control</td>
<td>1,3,6, 12</td>
<td>7-day point-prevalence abstinence and a self-efficacy measure</td>
<td>No intervention effect on abstinence or self-efficacy, although black callers reported greater abstinence than white callers at 3, and 12 mos. FU</td>
</tr>
</tbody>
</table>

# Intention to treat analysis

* Published as an abstract only
Telephone counselling for tobacco cessation – Overall summary

The literature reviewed here and in previous meta-analyses is consistently supportive of telephone counselling for tobacco cessation, although this support is generally limited to outcomes of short term follow-up (less than one year). In the previous meta-analytic literature reviews detailed in Table 3.1, the average pooled odds ratio was 1.34, indicating a statistically significant but moderate effect of telephone counselling services in assisting individuals reduce tobacco use compared with self-help material or no intervention control groups across an average follow-up period between seven and 15 months. In the more recent trials of telephone counselling services reviewed here, only one intervention demonstrated a statistically significant treatment effect at final follow-up. Thus, there is solid evidence suggesting that the treatment effects of telephone counselling services lose efficacy as follow-up assessments reach 12 months. However, this limitation to the efficacy of telephone counselling services is not unique to this delivery mechanism and also is seen in trials of face-to-face counselling services for tobacco cessation.

Despite the number of trials that were in support of telephone counselling, the call for more research regarding reactive helplines by Lichtenstein, and again most recently by Tzelepis, has not been adequately answered. In the previous two years, a total of seven trials have involved study of reactive helplines. Further, it is not clear how to most effectively deliver a tobacco telephone counselling intervention, with the majority of trials offering little to no information regarding how many sessions is optimal or which aspects of an intervention affected outcomes. Stead et al’s meta-analytic review provided one exception where a sub-analyses of 44 trials was conducted to determine the effect of number of sessions on treatment outcomes. The results showed that participants of interventions delivered as three to six sessions reported greater rates of point prevalence abstinence ($RR=1.34$, 95% CI=$1.23$-
1.47) compared to one to two sessions ($RR=1.07$, $95\% \ CI=0.91-1.26$). Unfortunately, the heterogeneity between trials of six or more sessions ($I^2=64\%$) was such that comparisons with this group were not meaningful in this meta-analysis. However, a more recent trial including an investigation of how many telephone counselling sessions is optimal for increasing tobacco use reductions has argued that the participant’s perception that the number of sessions delivered was adequate may be more predictive of treatment outcomes than the actual number of delivered sessions.$^{602}$

Without further research regarding which components of these tobacco use telephone counselling interventions promote greater efficacy, and if these interventions can maintain a statistically significant effect when compared to alternative intensive treatments, it is not likely that these interventions will improve beyond the demonstrated moderate efficacy. In order to provide a more sound background to the development of a telephone counselling service for cannabis cessation, the available non-tobacco substance use literature is systematically reviewed here.

**Telephone counselling for substance use – a literature review**

There have been no peer-reviewed summaries of literature concerning the use of telephone counselling to assist substance users reduce their use of substances other than tobacco. Despite this, literature on telephone counselling substance use services has been available for over fifty years.$^{620}$ To fill this gap in research, a systematic review of the literature was conducted.

Inclusion criteria to this initial review were published articles that included substance using participants and the use of telephone counselling services. As the literature in this area was thought to be relatively scant compared to articles relating to tobacco use no further restrictions were placed on the search. Studies were identified following a three-step process.
First, a title key word search for each of: “telephone counselling”, “telepsychiatry”, “telephone intervention”, and “telecounselling” was conducted on “Google Scholar” and “Ovid”. Second, the identified articles were scanned by title to determine which articles expressed a focus on telephone counselling for non-tobacco substance use. Third, the reference lists from any articles of interest were scanned to identify additional articles. The first step identified 9587 articles. Following the second two steps, however, 47 articles of interest were identified. One article was later dropped as use of the telephone was only a small component of the intervention tested.621

The selected articles fell into three categories: 1) the use of telephone contact as a form of aftercare, or as a tool to promote access to further aftercare treatments (18 articles); 622-639 2) the use of telephone contact as the primary form of substance use treatment (13 articles); 488, 640-651 and 3) descriptive articles that included caller profiles or information regarding the helpfulness of substance use helplines (15 articles).561, 565, 652-664

All but one of the descriptive articles detailed the characteristics of particular substance use helplines throughout the world, and often included caller profiles. Specifically, the helplines included anti-doping helplines for professional athletes in Japan,656 and Sweden;657 alcohol helplines in Sweden,663 and Canada,662 a cocaine helpline in the US;654, 659, 660, 664 a general substance use helpline in Australia;561, 653, 661 and a register of 22 general substance use helplines throughout Europe.658 These articles demonstrated the versatility of telephone counselling. In addition, they identified that females consistently use substance use helplines to a greater extent than males (with the exception of the anti-doping helplines) and that callers tend to be aged between 20-40 years.

The remaining descriptive study was conducted to determine the perceived helpfulness of substance use helplines in the US.565 In this study, two trained psychologists were recruited to
make 346 calls to 30 substance use helplines and record their opinion on whether the service was “helpful”, “neutral”, or “unhelpful” in assisting them with their scripted substance use concern. The reported helpfulness ratings were not uniform across different drugs of concern. More specifically, calls made regarding an alcohol, cocaine or heroin concern were more commonly recorded to be helpful (43, 40 and 40% were helpful) than were tobacco and cannabis concerns (28 and 25% were helpful).\(^5\)\(^6\) Notably, the majority of included helplines were not commonly thought to provide helpful advice for any substance of concern. These results parallel the call for more research regarding the efficacy of reactive helpline services.

*Telephone contact in aftercare following substance use treatment*

Individuals attempting to cease substance use frequently relapse after intervention, often following a lack of coping with negative emotions and cravings.\(^6\)\(^5\),\(^6\)\(^6\) In an attempt to prevent relapse, some individuals are referred into aftercare or step-down care following an initial treatment.\(^6\)\(^7\) Aftercare typically is delivered in a group format with a 12-step focus, and designed to provide ongoing assistance toward recovery by offering support or referral into further treatment.\(^6\)\(^8\)

The earliest trial of telephone counselling in aftercare, a case report, was published in 1970.\(^6\)\(^2\)\(^4\) The first RCT of a telephone-based aftercare service soon followed in 1976.\(^6\)\(^2\)\(^5\) Since this time 23 articles (16 separate interventions) have explored the use of telephone counselling in aftercare for substance use. Approximately half of these trials focused on alcohol use (seven out of 16 interventions).\(^6\)\(^2\)\(^3\)-\(^6\)\(^2\)\(^5\),\(^6\)\(^3\)\(^0\)-\(^6\)\(^3\)\(^3\),\(^6\)\(^6\)\(^9\) An additional two trials focused on alcohol and cocaine use,\(^6\)\(^2\)\(^2\),\(^6\)\(^2\)\(^6\),\(^6\)\(^3\)\(^5\),\(^6\)\(^3\)\(^8\),\(^6\)\(^3\)\(^9\),\(^6\)\(^7\)\(^0\) six trials investigated poly drug use,\(^6\)\(^2\)\(^1\),\(^6\)\(^2\)\(^7\)-\(^6\)\(^2\)\(^9\),\(^6\)\(^3\)\(^4\),\(^6\)\(^3\)\(^6\),\(^6\)\(^7\)\(^1\),\(^6\)\(^7\)\(^2\) and one trial investigated stimulant use.\(^6\)\(^3\)\(^7\) Across all studies, participants (totalling over 6,000 individuals) typically were older than 30 years and male. Follow up periods ranged from three months to three years (typically 12 months), and the outcomes
measured were largely point prevalence abstinence rates, drug related problems, and/or treatment attendance. In all cases participants were recruited through admission or discharge procedures from formal drug treatments. Details on each of these studies can be found in Table 3.3.
<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>‘n’ at first / last follow up</th>
<th>Age (M)</th>
<th>Sex (%)</th>
<th>Article type</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burleson &amp; Kaminer (2007)(^{623})</td>
<td>Alcohol</td>
<td>177 / 40</td>
<td>13-18 year range</td>
<td>Mixed</td>
<td>RCT</td>
<td>(1) Four 50 minute face-to-face sessions (2) Four 15 minute telephone counselling sessions (3) No intervention control</td>
<td>3, 6, 12</td>
<td>5-point Likert-type scale on eight items regarding endorsement for aftercare mode</td>
<td>Reported results referred only to the telephone counselling sessions – scores ranged from 1.5 (able to talk openly) to 2.9 (liking of sessions) out of 5 – both users and therapists supported the intervention</td>
</tr>
<tr>
<td>Catanzaro &amp; Green (1970)(^{624})</td>
<td>Alcohol</td>
<td>1/1</td>
<td>42</td>
<td>Female (100%)</td>
<td>Case report</td>
<td>(1) Two arranged calls from Wide Area Telephone Service (WATS) following discharge from an alcohol treatment service</td>
<td>3</td>
<td>Description of improvements in drinking for single case</td>
<td>Participant was reportedly “sober and progressing well”</td>
</tr>
<tr>
<td>Intagliata (1976)(^{625})</td>
<td>Alcohol</td>
<td>40 / 38</td>
<td>21-67 year range</td>
<td>Male (100%)</td>
<td>RCT</td>
<td>(1) 6 telephone sessions over ten weeks by the same therapist (2) 6 telephone sessions over ten weeks by different therapists (3) no contact control</td>
<td>3</td>
<td>Use of services post discharge</td>
<td>Intervention groups were combined in results as there were no btw. group differences in outcomes. Those receiving telephone sessions used more services ($p&lt;0.03$). Those who used more services were more likely to be abstinent at FU</td>
</tr>
<tr>
<td>McKay et al. (2005)(^{622, 626, 638, 639})</td>
<td>Alcohol, Cocaine</td>
<td>359 / 359 (ITT)</td>
<td>42 years</td>
<td>Male (83%)</td>
<td>RCT</td>
<td>(1) weekly telephone counselling sessions with supportive group and work book for 12 weeks (2) weekly relapse prevention and supportive group sessions for 12 weeks (3) bi-weekly, standard group sessions for 12 weeks (usual care control)</td>
<td>12, 24</td>
<td>Problem severity, self-reported substance use, participation in treatment services</td>
<td>Telephone sessions reported the highest rates of total abstinence when participants had low baseline rates of use. Improvements likely due to an increased focus on self-efficacy and commitment to abstinence in treatment. No significant treatment effects relating to problem severity, or use of services</td>
</tr>
</tbody>
</table>
### Table 3.3 (cont.) Trials regarding telephone contacts in substance use aftercare

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>‘n’ at first / last follow up</th>
<th>Age (M)</th>
<th>Sex (%)</th>
<th>Article type</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cacciola et al. (2008)</td>
<td>Poly Drug (74% alcohol)</td>
<td>4094 / 2024</td>
<td>43 years</td>
<td>Mixed</td>
<td>Trial</td>
<td>Continuing care calls were made bi-monthly for 3 months, and then monthly for 8 months (a median of 5 calls were answered)</td>
<td>12</td>
<td>Sobriety, communication with sponsors and attendance at 12-step programs</td>
<td>Alcohol and substance use, sponsor contacts, and treatment attendance increased with rates of telephone contact; particularly for males</td>
</tr>
<tr>
<td>Godley et al. (2010)</td>
<td>Poly Drug</td>
<td>104 / 88</td>
<td>32 years</td>
<td>Male (60%)</td>
<td>RCT</td>
<td>(1) telephone support once a week for one month and fortnightly for two months (average of 5 sessions received) (2) usual care control</td>
<td>3, 6</td>
<td>Percentage of 90 days abstinent, Substance Problem Scale, 5-point Likert-type satisfaction scale</td>
<td>No difference in abstinence days (low severity sub-sample showed improvements), telephone counselling group reported fewer substance problems at 3 month FU only ($p&lt;0.05$), 89% “sometimes” or “always” liked the telephone support</td>
</tr>
<tr>
<td>Hubbard, et al. (2007)</td>
<td>Poly Drug</td>
<td>339 / 241</td>
<td>≈ 30+ years (72% over 30)</td>
<td>Male (64%)</td>
<td>RCT</td>
<td>(1) seven ten minute telephone counselling calls across 12 weeks (average of 4 sessions received) (2) usual care control</td>
<td>3</td>
<td>Enrolment in outpatient treatment, drug and alcohol use</td>
<td>No significant difference btw. groups in treatment attendance or substance use by biological assay (trend towards increased attendance with telephone sessions). Females almost 3 times as likely to enter aftercare than males in both groups</td>
</tr>
<tr>
<td>Chong &amp; Herman-Stahl (2003)</td>
<td>Alcohol</td>
<td>30 / 30</td>
<td>19-46 years</td>
<td>Female (70%)</td>
<td>Trial</td>
<td>(1) “Telephone Aftercare Project” (no further description) – participants were all American Indians</td>
<td>3, 6</td>
<td>Native American Addiction Severity Index</td>
<td>87% reported alcohol use at baseline and 15-19% at follow up interviews; “legal” and “family/social” items showed significant improvement at 3 and 6 mos. FU, and “drugs” items at 6 mos. FU only</td>
</tr>
</tbody>
</table>
Table 3.3 (cont.) Trials regarding telephone contacts in substance use aftercare

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>'n' at first/last follow up</th>
<th>Age (M)</th>
<th>Sex (%)</th>
<th>Article type</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connors et al. (1992)</td>
<td>Alcohol</td>
<td>80 / 75</td>
<td>37 years</td>
<td>Male</td>
<td>RCT</td>
<td>(1) 8 telephone aftercare contacts over 6 months</td>
<td>6, 12</td>
<td># of drinks consumed in trial, 12-item alcohol problems scale, Likert scale on trial strategy utility</td>
<td>No btw. group differences in drinks consumed with all groups reducing use; telephone group reported sig. fewer problems; both aftercare conditions used more reduction strategies than control although no difference between intervention conditions</td>
</tr>
<tr>
<td>Fitzgerald &amp; Mulford (1985)</td>
<td>Alcohol</td>
<td>354 / 288 ≈ 30+ years</td>
<td>Male</td>
<td>(71%)</td>
<td>RCT</td>
<td>(1) Telephone contact every 2 weeks for 12 months</td>
<td>12</td>
<td>Alcoholic Stages Index, alcohol problems, days abstinent, satisfaction item</td>
<td>Intervention had no statistically significant effect on rates of recovery compared to control. 70% of participants thought the calls were “good treatment” and ≈55% reported them to be “very helpful”</td>
</tr>
<tr>
<td>Gilbert (1987)</td>
<td>Alcohol</td>
<td>96 / 64</td>
<td>45 years (average)</td>
<td>Male</td>
<td>RCT</td>
<td>(1) standard outpatient treatment (30 aftercare appointments) in hospital</td>
<td>12</td>
<td>Treatment attendance, drinking related variables, Brief Symptom Inventory, Self-Assessment Guide for social functioning</td>
<td>Home visit aftercare encouraged greater rates of treatment attendance than telephone and standard aftercare. Drinking variables and BSI showed pre-post gain with no btw. group differences. No gains were observed on social functioning.</td>
</tr>
<tr>
<td>Lash &amp; Blosser (1999)</td>
<td>Poly Drug</td>
<td>41 / 41 (66% alcohol)</td>
<td>44 years</td>
<td>Male</td>
<td>RCT</td>
<td>(1) automatic telephone prompts to attend, and feedback following attendance, to an aftercare session</td>
<td>2, 5</td>
<td>Aftercare attendance rates, hospital admission rates</td>
<td>Intervention attended more aftercare sessions but no difference in hospital readmissions for detoxification or medical and psychiatric care at 2 months. At 5 months, intervention showed less hospital readmission.</td>
</tr>
</tbody>
</table>
Table 3.3 (cont.) Trials regarding telephone contacts in substance use aftercare

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>‘n’ at first / last follow up</th>
<th>Age (M)</th>
<th>Sex (%)</th>
<th>Article type</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>McKay et al. (2011)</td>
<td>Alcohol &amp; Cocaine</td>
<td>252 / 194</td>
<td>43 years</td>
<td>Male</td>
<td>RCT</td>
<td>(1) treatment as usual (TAU) in an outpatient program (2) TAU + 5-10 minute telephone contacts over 18 months (Telephone Monitoring - TM) (3) TAU + TM + ≈12 sessions of counselling (TMC)</td>
<td>3,6,9, 12,15, 18,24</td>
<td>Indices of social support, readiness to change and prior treatment. Addiction Severity Index (ASI) past 30 day alcohol problem severity, 6-month alcohol use frequency and heavy use frequency, presence of cocaine in urine</td>
<td>Drinking variable gains in TM and TMC over TAU; TMC reported least frequency of any alcohol use and heavy use at 13-18 mos. FU (particularly at 15 mos for participants who indicated having social networks that supported alcohol use or had low readiness to change or had prior treatment history). TM more effective for women than men. Cocaine screening showed more positive results in treatment as usual at 9 mos. only</td>
</tr>
<tr>
<td>Stout et al. (2001)</td>
<td>Poly drug use (77% alcohol)</td>
<td>342 / 274</td>
<td>42 years</td>
<td>Male</td>
<td>RCT</td>
<td>(1) Telephone case-management aftercare for two years; 15 contacts (15-30 minute calls) with one call every one to two months to users, a significant other was called for a third of participants (2) usual care control</td>
<td>12-36</td>
<td>Days abstinent, drinks per drinking day, time to first drink, heavy drinking rates, cost-savings in first year relative to control</td>
<td>No intervention effects before third year; at final FU less heavy drinking in intervention and greater time to first drink. Intervention showed less drinking (12% vs 24% heavy drinking) and relapse rates of cannabis use (36% vs 67%) compared to control</td>
</tr>
</tbody>
</table>
### Table 3.3 (cont.) Trials regarding telephone contacts in substance use aftercare

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>‘n’ at first / last follow up</th>
<th>Age (M)</th>
<th>Sex (%)</th>
<th>Article type</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Farabee et al.¹  | Stimulant     | 500/250                     | 18-65 years | Mixed   | RCT          | (1) 7 unstructured/non-directive telephone counselling sessions (delivered fortnightly for 12 weeks)  
(2) 7 structured/non-directive sessions  
(3) 7 unstructured/directive sessions  
(4) 7 structured/directive sessions  
(5) usual care control           | 3, 12          | Addiction Severity Index (ASI), Concurrent Psychosocial Treatments, Drug Avoidance Activities Survey | Participants more satisfied with directive conditions (unstructured and structured). at 3 mos. FU; ASI drug use severity reduced for intervention groups (0.06-0.05) and increased for control (0.05-0.06). Intervention groups improved compared to control and attended more aftercare sessions and 12-step meetings |
| Foote & Erfurt (1991)² | Poly drug use | 325/not given                | Not given | Not given | RCT          | (1) special follow up of clients exiting an employee assistance program (average of 15 calls over one year delivered sporadically)  
(2) usual care control (average of 3 calls) | 12             | Work attendance, pay in lieu of wages during sick leave, health care utilisation (hospital visits for substance use) | No significant treatment interactions. This was blamed on the fact that the study design was not fully implemented. Only an average of 3 calls were successfully made for the intervention group and most other contacts were made in person at worksite |

¹“RCT”=Randomised controlled trial; “ITT”=Intention-to-treat analysis

²Farabee et al.’s article reports only preliminary results to a trial that was in the process of recruitment. Some further detail reported in the outcomes was provided by Farabee (the corresponding author from this article) by personal communication on 04.08.2011
Of the reviewed studies that measured participant satisfaction, participants were unanimously cited to value the services highly, irrespective of treatment outcomes. There was mixed support for the use of telephone counselling in aftercare when the considered outcome was a reduction in substance use, with eight articles reporting outcomes in favour of a telephone intervention over usual care, and five trials showing no statistically significant difference compared to usual care control. The eight trials favouring telephone counselling in aftercare each reported a caveat to this support. That is, two trials found positive outcomes only for participants with low baseline rates of substance use, one intervention was more effective for males compared to females, one intervention was particularly effective for individuals with low readiness to change and friends that supported their substance use, and a final trial resulted in positive outcomes for the frequency of heavy drinking days between the 24 and 36 month follow-up assessments only, and no intervention effect regarding percentage of abstinent days.

When regarding the use of telephone counselling to encourage participants to access additional treatment services, three of four trials measuring this intervention outcome demonstrated support. The exception was an initial trial reporting that telephone reminder calls (regarding appointment keeping rather than delivery of counselling) were not effective in influencing participants to attend aftercare treatment for alcohol use.

Overall, the research regarding the use of telephone counselling services in substance use aftercare is still underdeveloped with sometimes promising, but often mixed results. The gross heterogeneity between the outcome measures utilised, and a lack of exploration as to which intervention components predict outcomes, prevents any concrete conclusions regarding the extent to which telephone counselling should be extended to real-world aftercare settings.
Telephone counselling as a primary substance use treatment

In total, 13 studies were identified that were concerned with trialling telephone counselling as a primary substance use treatment. These trials investigated the effectiveness of telephone counselling as a substance use intervention in relation to alcohol use (nine studies, one of which also included cocaine use), benzodiazepine use (one trial), poly-drug use (two trials), and cannabis use (one trial). The majority of studies were randomised controlled trials (control groups were typically minimal interventions involving self-help materials) with three studies that were uncontrolled pilot studies. Across all studies, participants (totalling over 4,000 individuals) were generally older than 30 years and male. Follow up periods ranged between several weeks to 12 months. The recruitment methods also varied between trials, with four trials recruiting proactively through media advertisements (newspaper, magazine, radio etc.), and nine trials recruited treatment seekers reactively through treatment settings. Only one of the trials recruiting participants in treatment settings involved recruitment by a reactive helpline, with more common treatment settings being medical care centres. A summary of telephone counselling substance use intervention trials which used proactive recruitment can be found in Table 3.4, and those which used reactive recruitment are depicted in Table 3.5.
Table 3.4 Trials involving telephone counselling for substance use – proactive recruitment

| Author            | Drug       | ‘n’ at first / last follow up | Age (M) | Sex (% ) | Article type | Participant groups                                                                 | Follow up period in months | Main measures                                                                                           | Outcomes                                                                                                                                 |
|-------------------|------------|-------------------------------|---------|----------|--------------|-------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Baca et al.       | Alcohol    | 30 / 29                       | 37 years| Mixed    | RCT          | 2 Motivational interviewing sessions by: (1) interactive video (televideo) (2) telephone (3) face-to-face counselling | < 1                        | Comparisons in “acceptability” and “preference” measured on an abbreviated Likert-type scale                              | All modes of intervention delivery were equally acceptable. Comparing only telephone counselling with televideo counselling found that twice as many participants preferred televideo |
| Sanchez-Craig et al. | Alcohol     | 155 / 137                     | 42 years| Male     | RCT          | (1) Self-help booklet (2) Self-help booklet plus a 30 minute telephone counselling session with feedback on use | 3, 12                      | Percentage of “moderate drinkers”, and “moderate and problem free”; weekly standard drinks                                      | More qualified as ‘moderate’ (65% vs 43%) & ‘moderate and problem free drinkers’ (50% vs 37%) in telephone counselling intervention at 3 mos. FU. No treatment interaction at 12 mos. FU. More women than men rated as ‘moderate drinkers’ (71% compared to 52%). |
| Mulleady          | Benzos.    | 7 / 7                         | 63.5 years| Female | Trial        | 10 weekly 1.5 hour sessions delivered in group format using “teleconferencing facilities” | 2 and 5 weeks post final session | ‘Days of use’ (no range given), ‘dependency ratings’ (no detail given), Brief Symptom Inventory Previous week consumption diary, Measures of physical dependence and hazardous drinking | Reduction in use by 36% of days, dependency ratings dropped from 3 to 2. No significant change on the BSI                                                                                           |
| Heather et al.    | Alcohol    | 107 / 87                      | 45 years| Male     | RCT          | (1) Self-help manual (2) Manual plus IVR reporting (3) Manual plus 6 telephone interviews with “empathic response” (average of 4 calls received) (4) Educational material only control | 6                          |                                                                                                                                                                                                 | No difference between intervention groups, but all combined showed reduced consumption over control (76.4 units reduced to 52.5 units compared to 82.3 reduced to 63.3 units, or at FU 63% of intervention groups combined and 81% of controls drinking hazardously) |
Table 3.5 Trials involving telephone counselling for substance use – reactive recruitment

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug of concern</th>
<th>‘n’ at first / last follow up</th>
<th>Age range</th>
<th>Sex</th>
<th>Article type</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mello et al. (2008)</td>
<td>Alcohol</td>
<td>285 / 273</td>
<td>≈30 years (average)</td>
<td>Male (61%)</td>
<td>RCT</td>
<td>(1) alcohol assessment plus one 30 minute telephone-based intervention with a fifteen minute booster session (2) assessment only control</td>
<td>3</td>
<td>Alcohol Use Disorder Identification Test (AUDIT), Impaired Driving Scale,</td>
<td>AUDIT scores reduced for both groups. Telephone group showed greater reductions when baseline alcohol use was high. Telephone showed greater reductions over control for impaired diving.</td>
</tr>
<tr>
<td>Brown et al. (2007)</td>
<td>Alcohol</td>
<td>897 / 754</td>
<td>20 – 59 years</td>
<td>Mixed</td>
<td>RCT</td>
<td>(1) 3-6 telephone MI sessions and self-help booklet (only motivated clients received more than 3 sessions) (2) self-help material control</td>
<td>3</td>
<td>28 day diary of use (collected by TLFB method)</td>
<td>Significantly greater percentage decrease in 28 day consumption (17.3% vs. 12.9%) and risky drinking days (30% vs 8.3%) in the intervention condition over control for men only (i.e. not women). Treatment effect increased with number of sessions received in a linear fashion</td>
</tr>
<tr>
<td>Bischof et al. (2008)</td>
<td>Alcohol</td>
<td>408 / 374 (ITT)</td>
<td>≈36 years (average)</td>
<td>Male (≈68%)</td>
<td>RCT</td>
<td>(1) Up to 3 telephone MI sessions with computerised feedback (2) 4 telephone MI sessions and computerised feedback (3) no treatment control</td>
<td>12</td>
<td>Alcohol questions from the Munich Composite International Diagnostic Interview</td>
<td>At 12 mos. FU, reduction of episodic drinking for both telephone intervention groups over control (greater by 39%); but no within group difference in intervention groups and no reduction in binge drinking</td>
</tr>
<tr>
<td>Kim (1998)</td>
<td>Alcohol</td>
<td>294 / 110</td>
<td>48 years (average)</td>
<td>Male (64%)</td>
<td>RCT</td>
<td>(1) Three telephone counselling sessions over ten weeks with self-help booklet and personalized feedback (typically one session was received) (2) usual care control</td>
<td>3</td>
<td>Quantity/Frequency of drinking &amp; AUDIT used to create ‘at-risk’ group, Stage of change, measure of social support</td>
<td>Intervention showed significantly fewer ‘at-risk’ factors compared to control (0.54 vs. 0.78) and fewer met ‘at-risk’ criteria (41% vs. 56%), particularly if they had a low ‘at-risk’ status at baseline and were intrinsically motivated prior to participation</td>
</tr>
</tbody>
</table>
Table 3.5 (cont.) Trials involving telephone counselling for substance use – reactive recruitment

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug of concern</th>
<th>‘n’ at first / last follow up</th>
<th>Age range</th>
<th>Sex</th>
<th>Article type</th>
<th>Participant groups</th>
<th>Follow up period in months</th>
<th>Main measures</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oslin et al. (2003)</td>
<td>Alcohol</td>
<td>97 / 74</td>
<td>62 years</td>
<td>Male</td>
<td>RCT</td>
<td>(1) seven telephone counselling sessions over 24 weeks plus a work book (2) no contract control but given referral options</td>
<td>4</td>
<td>7 day use, and binges, Hamilton Rating scale for Depression</td>
<td>Average drinks per week, average binges per three month period, and depression severity all reduced significantly more in telephone sessions compared to control</td>
</tr>
<tr>
<td>Alemi et al. (1997)</td>
<td>Poly drug</td>
<td>47 / 47</td>
<td>Not given</td>
<td>Female</td>
<td>Trial</td>
<td>(1) 59 weekly sessions of group teleconferencing (typically 1.3 sessions were received) for pregnant women</td>
<td>7</td>
<td>Teleconference participation rates (no information on substance use was provided)</td>
<td>29 participants (61.7%) participated in at least 1 support group session although only 4 participants (8.5%) attended more than three sessions.</td>
</tr>
<tr>
<td>Sabag-Cohen et al. (2009)</td>
<td>Poly Drug</td>
<td>20 / 12</td>
<td>47 years</td>
<td>Male</td>
<td>Trial</td>
<td>(1) 12 telephone counselling sessions over 8 weeks (typically 8.7 sessions were received) for individuals on an organ donation list</td>
<td>2</td>
<td>Helping Alliance Questionnaire-II, Satisfaction with Services Questionnaire</td>
<td>HAQ-II score of 86 (“good” alliance), SSQ ranged from 2.42 – 5.0 (out of 5 in 18 items) with an average score above 4 out of 5 representing high satisfaction.</td>
</tr>
<tr>
<td>Alemi et al. (1996)</td>
<td>Alcohol + Cocaine</td>
<td>179 / 160</td>
<td>27 years</td>
<td>Female</td>
<td>RCT</td>
<td>(1) usual care plus access to computer services delivered via telephone (motivational messages and prayer), teleconferencing, and a follow up monitoring service (2) usual care control (1) 15 minute MI based telephone counselling session (2) Self-help minimal intervention control</td>
<td>6</td>
<td>Treatment attendance, General Health Survey, Addiction Severity Index (for alcohol and drugs)</td>
<td>No difference between groups on use of services, health status, or drug use. However the intervention group entered treatment more frequently than control if baseline drug scores were high</td>
</tr>
<tr>
<td>Fernandes et al. (2010)</td>
<td>Cannabis</td>
<td>1744 / 524</td>
<td>25 years</td>
<td>Male</td>
<td>RCT</td>
<td>(1) 15 minute MI based telephone counselling session (2) Self-help minimal intervention control</td>
<td>1-6</td>
<td>Brazilian Household Surveys items on Drug Abuse</td>
<td>Intervention group 1.6 (95% CI 1.2-2.0) times as likely to achieve abstinence at 1 mos. FU. Participants were highly motivated and a significant intervention effect was reported at 6 mos.</td>
</tr>
</tbody>
</table>

‘RCT’=Randomised controlled trial; “ITT”=Intention-to-treat analysis
In the 13 reviewed trials, there was mixed support for telephone counselling as a substance use intervention. A total of three trials (recruiting a total of 79 participants) included a measure of satisfaction with telephone interventions, and only one of those three trials indicated that participants (n=20) found the telephone intervention satisfying. This finding supports Heustis et al.'s descriptive paper regarding the perceived lack of helpfulness of substance use helplines. The effectiveness of telephone counselling in assisting participants to reduce their substance use and/or related problems compared to usual care or self-help material control groups was investigated in nine trials. All but one of these reported that the associated telephone intervention was efficacious on at least one substance use outcome measure, although in most cases a caveat that influenced the efficacy of the intervention outcomes was reported. Only two trials did not report any such caveats to the efficacy of telephone counselling. Those trials reporting caveats to the telephone intervention efficacy described: 1) a lack of significant intervention effect on improvements to substance problems beyond 3 month follow-up, and no intervention effect on frequency of use; 2) a lack of significant intervention effect on measures of mental health, despite reductions in frequency of use; 3) a lack of significant difference between telephone counselling and a self-help material intervention (with both groups showing comparable improvements compared to control); 4) a lack of significant intervention effect for participants with baseline substance use that was low, or high, and 5) a lack of significant intervention effect for female participants compared to males.

Overall, the outcomes reported by trials of telephone counselling services as substance use interventions were similar to those reported by trials of telephone counselling services in aftercare. That is, telephone counselling appears to be promising, but support for its practice is often mixed. Further, information regarding the implementation of telephone counselling services, the training required, and the counselling methods utilised were typically not
reported. As such, there remains a need for literature in the area to standardise the outcome measures utilised, and to provide greater detail to the aspects of an intervention thought to relate to improved treatment outcomes. Without this additional research, conclusions as to the general efficacy of non-tobacco substance use telephone counselling are not well informed.

In particular, there is a need for additional research to determine the efficacy of a telephone intervention relating to illicit drug use and to determine the efficacy of an existing reactive helpline (a reactive helpline is defined by receiving calls as opposed to also making calls as would be the case in delivering an intervention over multiple sessions). To date, six trials have specified a particular illicit drug, and a total of seven trials investigated substance use more generally. Notably, only one trial investigated the efficacy of a reactive helpline.

**Telephone counselling in substance use treatment – summary of controlled trials**

As discussed, further research is necessary to draw conclusions regarding the efficacy of telephone counselling for assisting individuals to reduce substance use. In order to provide a clearer picture of the literature available, a systematic review was conducted. To do so, the included literature was required to report treatment outcomes in such a way that it could be manipulated to provide an overall effect size for the particular trial compared to control. Adequate information to provide an effect size on treatment outcomes was obtained from 10 of the 26 articles regarding the use of telephone counselling services in substance use aftercare, and from seven of the 13 articles regarding the use of telephone counselling services as a substance use intervention (relating to a total of 15 different telephone interventions).

Unfortunately, pooling the effect sizes from these 15 interventions was not appropriate as: 1) there was great variance in the included outcome measures, 2) the trials recruited small
sample sizes, and 3) there was a lack of detail reported in many of the associated articles. As shown in Table 3.6, only five trials reported an approximately moderate between-group intervention effect (Cohen’s $d$ of at least 0.4).\textsuperscript{633, 635, 641, 647, 670} Among these trials, only McKay et al.’s research group included a sample size greater than 30 participants (lending adequate power to the associated analyses), and this group also incorporated the longest follow-up assessment where an approximately moderate between-group intervention effect ($d=0.42$) was maintained to 24-month follow-up.\textsuperscript{635}
Table 3.6 Summary of systematic review results regarding telephone contacts for reducing substance use

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>Variable of interest</th>
<th>Final N (experiment / control)</th>
<th>Sex(^a)</th>
<th>Follow up period (months)</th>
<th>telephone contacts (approx. number)</th>
<th>Self-help booklet ?</th>
<th>Effect size (d)</th>
<th>Effect size 95% CI</th>
<th>Results lending to effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alemi et al. (1996)(^{448})</td>
<td>Alcohol</td>
<td>Addiction Severity Index</td>
<td>82 / 78</td>
<td>F</td>
<td>6</td>
<td>13</td>
<td>N</td>
<td>-0.02</td>
<td>-0.33 - 0.29</td>
<td>% improvement</td>
</tr>
<tr>
<td>Alemi et al. (1996)(^{448})</td>
<td>Cocaine</td>
<td>Addiction Severity Index</td>
<td>82 / 78</td>
<td>F</td>
<td>6</td>
<td>13</td>
<td>N</td>
<td>-0.01</td>
<td>-0.32 - 0.30</td>
<td>% improvement</td>
</tr>
<tr>
<td>Sanchez-Craig et al. (1996)(^{441})</td>
<td>Alcohol</td>
<td>weekly drinking</td>
<td>33 / 45(^{^^})</td>
<td>M</td>
<td>3</td>
<td>1</td>
<td>Y</td>
<td>0.29</td>
<td>-0.11 - 0.69</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Sanchez-Craig et al. (1996)(^{441})</td>
<td>Alcohol</td>
<td>weekly drinking</td>
<td>27 / 17(^{^^})</td>
<td>F</td>
<td>3</td>
<td>1</td>
<td>Y</td>
<td>0.26</td>
<td>-0.27 - 0.79</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Sanchez-Craig et al. (1996)(^{441})</td>
<td>Alcohol</td>
<td>weekly drinking</td>
<td>32 / 43(^{^^})</td>
<td>M</td>
<td>12</td>
<td>1</td>
<td>Y</td>
<td>0.14</td>
<td>-0.26 - 0.54</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Sanchez-Craig et al. (1996)(^{441})</td>
<td>Alcohol</td>
<td>weekly drinking</td>
<td>26 / 17(^{^^})</td>
<td>F</td>
<td>12</td>
<td>1</td>
<td>Y</td>
<td>0.42</td>
<td>-0.12 - 0.95</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Mello et al. (2008)(^{443})</td>
<td>Alcohol</td>
<td>AUDIT (risky drinking)</td>
<td>130 / 143</td>
<td>Mixed</td>
<td>3</td>
<td>2</td>
<td>N</td>
<td>0.01</td>
<td>-0.08 - 0.38</td>
<td>Change scores</td>
</tr>
<tr>
<td>Bischof et al. (2008)(^{445})</td>
<td>Alcohol</td>
<td>grams per day</td>
<td>248(^{\Delta})/126</td>
<td>M</td>
<td>12</td>
<td>4</td>
<td>N</td>
<td>0.28</td>
<td>0.07 - 0.48</td>
<td>Mean (SD)(^{\Delta})</td>
</tr>
<tr>
<td>Oslin et al. (2003)(^{447})</td>
<td>Alcohol</td>
<td>weekly drinking</td>
<td>16/15</td>
<td>M</td>
<td>6</td>
<td>7</td>
<td>Y</td>
<td>0.38</td>
<td>-0.33 - 1.09</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Oslin et al. (2003)(^{447})</td>
<td>Alcohol</td>
<td>binge drinking episodes</td>
<td>16/15</td>
<td>M</td>
<td>6</td>
<td>7</td>
<td>Y</td>
<td>0.72</td>
<td>-0.01 - 1.44</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Fernandes et al. (2010)(^{488})</td>
<td>Cannabis</td>
<td>Cones/joints per day</td>
<td>262/262</td>
<td>M</td>
<td>6</td>
<td>8</td>
<td>Y</td>
<td>0.03</td>
<td>-0.14 - 0.2</td>
<td>Mean (SD)(^{\Delta})</td>
</tr>
<tr>
<td>Brown et al. (2007)(^{444})</td>
<td>Alcohol</td>
<td>28 day drinking</td>
<td>162/174(^{^^})</td>
<td>M</td>
<td>3</td>
<td>6</td>
<td>Y</td>
<td>0.02</td>
<td>-0.18 - 0.21</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Brown et al. (2007)(^{444})</td>
<td>Alcohol</td>
<td>28 day drinking</td>
<td>200/218(^{^^})</td>
<td>F</td>
<td>3</td>
<td>6</td>
<td>Y</td>
<td>0.05</td>
<td>-0.13 - 0.22</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Brown et al. (2007)(^{444})</td>
<td>Alcohol</td>
<td>risky drinking days</td>
<td>162/174(^{^^})</td>
<td>M</td>
<td>3</td>
<td>6</td>
<td>Y</td>
<td>0.19</td>
<td>-0.01 - 0.38</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Brown et al. (2007)(^{444})</td>
<td>Alcohol</td>
<td>risky drinking days</td>
<td>200/218(^{^^})</td>
<td>F</td>
<td>3</td>
<td>6</td>
<td>Y</td>
<td>0.07</td>
<td>-0.1 - 0.25</td>
<td>Mean (SD)</td>
</tr>
</tbody>
</table>
Table 3.6 (cont.) Summary of systematic review results regarding telephone contacts for reducing substance use

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>Variable of interest</th>
<th>Final N (experiment/control)</th>
<th>Sex*</th>
<th>Follow up period (months)</th>
<th>telephone contacts (approx. number)</th>
<th>Self-help booklet?</th>
<th>Effect size (d)</th>
<th>Effect size 95% CI</th>
<th>Results lending to effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heather et al. (1990)</td>
<td>Alcohol</td>
<td>weekly drinking</td>
<td>19 / 23</td>
<td>M</td>
<td>6</td>
<td>2</td>
<td>Y</td>
<td>0.10</td>
<td>-0.46-0.65</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>McKay et al. (2004)</td>
<td>Alcohol</td>
<td>weekly drinking</td>
<td>18 / 23</td>
<td>M</td>
<td>6</td>
<td>3</td>
<td>Y</td>
<td>0.11</td>
<td>-0.45-0.67</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>McKay et al. (2004)</td>
<td>Alcohol + Cocaine</td>
<td>% days abstinent</td>
<td>91 / 115</td>
<td>M</td>
<td>12</td>
<td>12</td>
<td>Y</td>
<td>0.16</td>
<td>-0.10-0.43</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>McKay et al. (2004)</td>
<td>Alcohol + Cocaine</td>
<td>% total abstinence</td>
<td>91 / 115</td>
<td>M</td>
<td>12</td>
<td>12</td>
<td>Y</td>
<td>0.16</td>
<td>-0.11-0.44</td>
<td>z-score</td>
</tr>
<tr>
<td>McKay et al. (2005)</td>
<td>Alcohol + Cocaine</td>
<td>% days abstinent</td>
<td>85 / 104</td>
<td>M</td>
<td>24</td>
<td>12</td>
<td>Y</td>
<td>0.23</td>
<td>-0.03-0.49</td>
<td>Mean (SD)^*</td>
</tr>
<tr>
<td>McKay et al. (2005)</td>
<td>Alcohol + Cocaine</td>
<td>% total abstinence</td>
<td>85 / 104</td>
<td>M</td>
<td>24</td>
<td>12</td>
<td>Y</td>
<td>0.29</td>
<td>0.00-0.58</td>
<td>z-score</td>
</tr>
<tr>
<td>McKay et al. (2010)</td>
<td>Alcohol</td>
<td>% days abstinent</td>
<td>59 / 69</td>
<td>M</td>
<td>18</td>
<td>18</td>
<td>Y</td>
<td>0.53</td>
<td>0.17-0.88</td>
<td>Chi-square</td>
</tr>
<tr>
<td>McKay et al. (2010)</td>
<td>Alcohol</td>
<td>% days heavy drinking</td>
<td>59 / 69</td>
<td>M</td>
<td>18</td>
<td>18</td>
<td>Y</td>
<td>0.50</td>
<td>0.14-0.85</td>
<td>Chi-square</td>
</tr>
<tr>
<td>McKay et al. (2010)</td>
<td>Cocaine</td>
<td>% positive urine screens</td>
<td>58 / 60^^</td>
<td>M</td>
<td>18</td>
<td>18</td>
<td>Y</td>
<td>0.21</td>
<td>-0.15-0.57</td>
<td>Chi-square</td>
</tr>
<tr>
<td>Hubbard et al. (2007)</td>
<td>Pol Drug</td>
<td>% total abstinence</td>
<td>107 / 107^^</td>
<td>M</td>
<td>3</td>
<td>14</td>
<td>N</td>
<td>0.19</td>
<td>0.08-0.46</td>
<td>Percentage</td>
</tr>
<tr>
<td>Connors et al. (1992)</td>
<td>Pol Drug</td>
<td>Number of days abstinent</td>
<td>60 / 15</td>
<td>M</td>
<td>12</td>
<td>8</td>
<td>N</td>
<td>0.03</td>
<td>-0.51-0.56</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Fitzgerald et al. (1985)</td>
<td>Alcohol</td>
<td>Longest period of days abstinent</td>
<td>84 / 125</td>
<td>M</td>
<td>12</td>
<td>15</td>
<td>N</td>
<td>0.01</td>
<td>-0.27-0.28</td>
<td>Mean (SD)</td>
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</tbody>
</table>
Table 3.6 (cont.) Summary of systematic review results regarding telephone contacts for reducing substance use

<table>
<thead>
<tr>
<th>Author</th>
<th>Drug</th>
<th>Variable of interest</th>
<th>Final N (experiment / control)</th>
<th>Sex</th>
<th>Follow up period (months)</th>
<th>telephone contacts (approx. number)</th>
<th>Self-help booklet ?</th>
<th>Effect size (d)</th>
<th>Effect size 95% CI</th>
<th>Results lending to effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitzgerald et al. (1985)</td>
<td>Alcohol</td>
<td>Longest period of days abstinent</td>
<td>37/39</td>
<td>M</td>
<td>12</td>
<td>15</td>
<td>N</td>
<td>0.20</td>
<td>-0.25-0.065</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Gilbert et al. (1987)</td>
<td>Alcohol</td>
<td>Combined quantity/frequency score</td>
<td>21/21</td>
<td>M</td>
<td>12</td>
<td>- -</td>
<td>N</td>
<td>0.67</td>
<td>0.17-1.17</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Gilbert et al. (1987)</td>
<td>Alcohol</td>
<td>Number of days abstinent</td>
<td>21/21</td>
<td>M</td>
<td>12</td>
<td>- -</td>
<td>N</td>
<td>0.36</td>
<td>-0.13-0.86</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Gilbert et al. (1987)</td>
<td>Alcohol</td>
<td>Dependence symptoms</td>
<td>21/21</td>
<td>M</td>
<td>12</td>
<td>- -</td>
<td>N</td>
<td>0.23</td>
<td>-0.27-0.72</td>
<td>Mean (SD)</td>
</tr>
</tbody>
</table>

Note: some studies were underpowered due to small sample sizes and relatively large effect sizes were reported; e.g. Oslin et al. (2003) and Gilbert et al. (1987).

“AUDIT”=Alcohol use disorder identification test

# Intention to treat analysis

- - Not reported

^ Provided by personal communication with the corresponding author Fernandes, on 11.08.2010 and McKay, on 14.05.2010

^^ Insufficient information was present in this article to accurately determine the number of participants in the intervention and control groups at final follow-up assessment. Instead the numbers presented are either based on reported group percentages or an assumption that loss to follow-up was equal between groups.

Δ This article reported on more than one telephone counselling intervention as a combined figure and no significant differences were found between intervention groups. In some cases this required that the reported means and standard deviations of treatment outcomes be averaged to give an appropriate intervention score

a Sex is reported as ‘M’ if the sample was more than 60% male, ‘F’ if the sample was more than 60% female, and is otherwise reported as ‘Mixed’
TELEPHONE COUNSELLING – WHAT HAVE WE LEARNED AND WHERE TO FROM HERE?

The many advantages of telephone counselling, and relatively few drawbacks, suggest that substance use treatment may be effectively delivered by the telephone. Over the past fifty years, a growing body of evidence regarding the efficacy of telephone-based substance use interventions has emerged. In total 29 different trials of a non-tobacco substance use telephone-based intervention were identified. In a very general sense, only seven of these trials failed to report an intervention effect on at least one outcome measure compared to self-help manual or usual care control groups.621, 631-633, 640, 649, 651 The majority of trials accounting for participant satisfaction, however, did not report positive outcomes.142, 15, 2565 In addition, several large gaps in the research remain, making conclusive statements that this form of treatment is efficacious difficult.

First, the research available is almost exclusive to licit substances, with little research regarding existing reactive services, and generally focuses on tobacco use over alcohol use. Further, the alcohol use interventions that involve telephone-based applications are largely in the provision of aftercare, following formal treatments, rather than stand-alone interventions. This particular lack of research regarding reactive helplines has been identified by multiple literature review articles and remains to be an issue.550, 600 Regarding illicit substance use reductions, seven articles provided enough detail in the reported treatment outcomes that an effect size for the intervention could be calculated.488, 626, 628, 629, 638, 648, 670 Of these, a single trial reported a statistically significant intervention effect on reductions in illicit substance using days at final follow-up.626
Second, the literature available rarely includes analysis of predictors of treatment outcomes. This makes it difficult to determine which aspects of a telephone-based intervention are important, how many sessions is best, which style of counselling is most appropriate, or which demographic group might benefit the most. Some trials recorded that participant characteristics including baseline substance use and participant gender influenced treatment outcomes, however, the findings were grossly inconsistent. That is, some authors reported that lower baseline use resulted in greater intervention effect, while other authors reported the reverse. Similarly, some trials reported a greater intervention effect for males than females, while other trials indicated the reverse. Further, the majority of the reviewed trials recruited mostly male participants, with relatively few trials including females or mixed genders. This is particularly problematic given that females appear to utilise helplines to a greater extent than males.

Third, the outcome measures and follow-up periods that are included in these trials vary greatly between studies. Point prevalence abstinence is a common treatment outcome across studies; however, the number of days that substance use is observed varies from one week to several months. Notably, regardless of the treatment outcome being measured, telephone-based interventions do not appear to be effective beyond 12 months. One exception to this is the work of McKay et al. who have conducted two separate trials reporting intervention efficacy regarding alcohol use outcomes at 24 month follow-up.

Fourth, the research on telephone-based interventions has generally involved stand-alone treatments that are separate from real-world telephone services. This is problematic for two reasons. Firstly, real-world services will remain to be considered
efficacious *prima facie* without reference to an evidence base. Second, the stand-alone telephone-based interventions that are found to be efficacious may not be easily translated to the current real-world services and lose external validity.

Finally, there is little evidence of coordination between research groups, with the majority of trials piloting interventions, rather than making improvements on existing interventions and moving the field of research beyond comparisons with minimal intervention control groups. Again, McKay’s research group were an exception as their initial telephone-based aftercare trial\textsuperscript{128,140} was used as a basis for a second trial by these authors,\textsuperscript{635,670} and a separate trial by Kaminer and Burleson.\textsuperscript{623,669}

These gaps in research have implications on future research regarding telephone-based substance use interventions. First, future trials should include multiple measures of treatment outcome as well as possible predictors of treatment success, such as participant characteristics (requiring a mix of male and female participants) and intervention content (requiring description of the number of sessions, counselling style used, and so on). Second, participants should be recruited from individuals seeking treatment (reactive recruitment) as previous work has typically used alternate recruitment methods such as by media advertisements (proactive recruitment). Specifically, future work should focus on an existing illicit drug helpline to determine its efficacy in proactively delivering an intervention. Third, future trials should be founded on previous work in the field so as to improve upon existing trials rather than ’re-inventing the wheel’.

To address these gaps in research, the present thesis describes a process and impact evaluation of an existing reactive cannabis helpline, and the development and evaluation of a telephone-based cannabis intervention. Specifically, the following two chapters
detail the *Cannabis Information and Helpline* and the satisfaction of its callers, and in doing so, provide an initial process and impact evaluation of an Australian illicit substance use helpline. Then, accounting for the lessons learnt in the literature review discussed here and in the process and impact evaluation, the remaining chapters discuss the development and evaluation of a telephone-based intervention for cannabis use disorder.
CHAPTER FOUR: THE CANNABIS INFORMATION AND HELPLINE - PROCESS EVALUATION

OVERVIEW

The present chapter describes each of the substance use helplines that operated nationally in Australia at the time of writing and refers to published literature. As the Cannabis Information and Helpline (CIH) was chosen to deliver the brief telephone-based cannabis intervention which is detailed in the present thesis, this service is described in particular detail. To further establish the CIH as an appropriate choice to deliver a brief cannabis intervention, a study of call data was conducted. This study (hereby referred to as the CIH ‘process evaluation’) clarified how the CIH service is utilised by cannabis users and to what extent.

ON SELECTING A SUBSTANCE USE HELPLINE TO DELIVER A TELEPHONE-BASED CANNABIS USE INTERVENTION

The major requirements for a substance use helpline to be selected in order to deliver a cannabis intervention were that the helpline received calls from cannabis treatment seekers throughout Australia, and had the capacity to maintain contact with these individuals. Following the systematic literature review described in Chapter Three it was evident that only a handful of substance use helplines operated in Australia, and research regarding their operation was scarce. The only review of Australian non-profit telephone and web-based counselling services was conducted in 2002, and reported that four helplines targeted callers with drug or alcohol concerns. The content of this review, however, was focused on mental health services, such as Lifeline. In fact, only one Australian national service for substance users had received attention in the
empirical literature – the tobacco specific *Quitline*. This helpline was the only national telephone service targeting substance users in Australia. Another notable helpline, the *Alcohol and Drug Information Service* (ADIS), was available throughout Australia but operated autonomously under the direction of state and territory governments. The Victorian arm of ADIS, *DirectLine*, is the only other Australian substance use helpline to have received scholarly attention. The CIH, which was the ultimate choice to provide a telephone-based cannabis use intervention, operated as a national service for cannabis users since 2008 and sought to undertake rigorous evaluation. Prior to describing a process evaluation of the CIH, the research depicting each of the Australian substance use helplines is described here.

**The tobacco Quitline**

*Quitline* provides reactive and proactive telephone support for people wanting to stop smoking tobacco throughout Australia. Wakefield and Miller conducted two studies to evaluate the *Quitline* service by investigating call rates to the *Quitline* service, the satisfaction of callers, and treatment outcomes. Call data during the Australian National Tobacco Campaign between June and December, 1997, was utilised in the first study on call rates. The *Quitline* answered approximately 6000 calls per week during the Campaign and, based on population data, the authors concluded that the *Quitline* service was utilised by approximately 1 in 25 Australian smokers aged 18 years or older. The second study interviewed 1090 callers over a period of 12 months (with a final follow up rate of 45%) to determine the point prevalence rates of abstinence and the participants’ satisfaction with the service. The participants reported abstinence at a point prevalence rate of 3% at baseline, 19% at three weeks, 24% at six months, and 29% at 12 months post call. In comparison, a review of studies reporting the abstinence
rates of untreated tobacco smokers showed that less 5% will be abstinent from tobacco smoking at 12 months from a quit attempt. Approximately one third (31%) of participants reported that they would “consider calling the helpline again”, and the majority found the helpline “helpful” (62%) and would “recommend the helpline to a friend” (79%). The authors concluded that “the Quitline offers an effective quit smoking service to Australian smokers who are interested in quitting”. As this service did not typically receive calls from cannabis treatment seekers, this service was not chosen to provide a telephone-based cannabis use intervention.

The Alcohol and Drug Information Service

The Alcohol and Drug Information Service (ADIS) operates independently in each state and territory throughout Australia providing a “confidential, non-judgemental 24 hour/seven days a week helpline for anybody seeking assistance with alcohol or other drug use” (http://www.dao.health.wa.gov.au). DirectLine, the Victorian ADIS service provider, was established to provide telephone counselling, information and referral services for Victorians with drug or alcohol concerns. Throughout 2001 Directline answered over 50,000 calls regarding substance use enquiries (although at the time DirectLine was receiving calls from the Northern Territory and Tasmania in addition to Victoria), placing the service above seven other substance use helplines available in Victoria (the Drug and Alcohol Clinical Advisory Service, Youth Substance Abuse Service, Drug diversion line, Syringe disposal helpline, Family Drug Help, Drug Info Clearinghouse, and Quitline Victoria). Two internal studies were conducted by the DirectLine service.

The first was a study of 310 callers to the service (the duration of recruitment was not specified) who were surveyed by the answering counsellor following verbal consent.
Callers were typically alcohol users (55%), although cannabis was the most frequently reported main illicit drug of concern (24%). Approximately half the sample (45%) had no previous experience of seeking help for substance use. The reported demographic profile of callers was limited to relationship (approximately one third were in a relationship), employment (40% of participants were employed), and education status (60% of participants had completed secondary education). In total, over 90% of the sample reported being satisfied with the service.

The second study focused on the referral function by the service. In this study, 258 callers were interviewed one month after their original call to DirectLine. The most common type of referral offered was for counselling (57%), and most participants (64%) reported making contact with the referral agency. Making contact with the service to which they were referred was found to be more common for males than females (73% of males compared to 55% of females). Although no further frequency data was reported, being single and unemployed was noted to decrease the likelihood of contacting a referred agency.

As ADIS received calls from cannabis treatment seekers, it could potentially deliver a telephone-based cannabis specific intervention throughout Australia. The impediments to the ADIS service providing a specialist cannabis service were two-fold. Firstly, the ADIS service did not have a specific focus to cannabis use concerns and its staff did not have specialist training in cannabis or in the delivery of brief interventions. The frequency to which callers had a cannabis-related concern was approximately one of every five calls between 2007 and 2009 for the Queensland (G. Hamilton, personal communication, 4 February, 2010), South Australian (L. Stevens, personal communication, 21 September, 2009), and Western Australian services (L-A. Raeside,
personal communication, 2 September, 2009). Secondly, the separate ADIS services operating under state government control do not collaborate to collate a nationwide database regarding the cannabis use concerns of callers (L. Stevens, personal communication, 31 August, 2009). Thus, information pertaining to the reach of the ADIS service throughout Australia was not available, and the services could not be co-ordinated.

The available evidence regarding substance use helplines in Australia highlights that these services are well utilised and well received by substance users. Of the substance use helplines available to all Australians (Quitline, ADIS, and the CIH), the CIH was the only national service that operated specifically for individuals with cannabis use concerns. As such, the CIH was chosen to be approached in order to operate a telephone-based cannabis intervention for individuals interested in reducing their use throughout Australia. To determine the appropriateness of this choice two evaluation studies were conducted to address the absence of any previous research. First, a process evaluation was conducted to detail the characteristics of callers to the service and how the service operates. Second, an impact evaluation was conducted to detail how well received the service is by the callers to the service. The process evaluation is depicted here, with the impact evaluation detailed in the following chapter.

The Cannabis Information and Helpline

The Cannabis Information and Helpline (CIH) was launched in January 2008. Four years earlier, in late 2004, the Ministerial Council on Drug Strategy (MCDS) recognised the health, psychological, legal and public health issues associated with cannabis use in Australia and agreed to develop the 2006 - 2009 National Cannabis Strategy (hereby referred to as ‘the Strategy’). The Strategy was endorsed by all Australian state and
territory health and law enforcement ministers in May, 2006, and had four priority areas: 1) to increase community understanding of cannabis, 2) to prevent the use of cannabis, 3) to prevent the problems associated with cannabis, and 4) to respond to the problems associated with cannabis.

To assist in actioning these four priority areas, the Strategy stressed the importance of acting on several key activities, including the establishment of a “Cannabis Line”. In 2007, as the result of a national tender, the Australian Government responded to the Strategy by establishing the National Cannabis Prevention and Information Centre (NCPIC) – a Centre with a mission to “reduce the use of cannabis in Australia by preventing uptake and harms associated with its use in the Australian community” (see http://ncpic.org.au/ncpic/about/mission/).

The Strategy also recommended that a “Cannabis Line” should be established to provide information and referral to parents, friends and cannabis users to enhance public knowledge about cannabis and assist in cannabis use reductions. This recommendation was made with the understanding that individuals with cannabis use concerns in Australia frequently contact counselling services. This preference for counselling did not specify format and it may well be the case that they would prefer a service that does not involve face-to-face contact due to the desire to avoid the stigma associated with entering drug treatment and to remain anonymous. It was suggested that the Cannabis Line be analogous to the existing tobacco Quitline.

In January 2008, NCPIC collaborated with Lifeline, Australia’s first national helpline, to fund and launch the CIH - Australia’s first free national helpline specific to cannabis-related concerns. Under the guidance of NCPIC and Lifeline, the CIH became a significant part of a coordinated effort to instigate the four priorities identified in the
Strategy. The CIH addressed the Strategy priorities by offering a reactive service allowing callers with cannabis-related concerns to freely access counsellors trained in the principals of motivational interviewing (MI)\(^{363,364}\) and cognitive behavioural techniques (CBT)\(^{366,367}\) (see Chapter Two pp. 35-36 for discussion on these techniques). In addition to counselling, the counsellors were to provide information, resources and referrals for cannabis users and for individuals who called with concerns about cannabis use by those close to them.

*The Cannabis Information and Helpline staff and operations*

At the time of its inception in 2008, the CIH consisted of 14 staff members operating out of a *Lifeline* office in New South Wales, Australia. At least one supervisor and one to three counsellor staff operated two to four telephones during the hours of operation (if management staff thought call rates could be high - such as when advertising was initiated - a greater number of staff would operate the telephones). The CIH operated nine hours a day on six days per week (excluding Sunday), and returned calls to clients leaving contact details via answering machine outside of these hours.

Each telephone counsellor was required to have a minimum of one year experience in telephone counselling (the initial team of counsellors had all worked on the Domestic Violence Line for four years) and a tertiary qualification in face-to-face counselling or equivalent (such as a TAFE awarded Certificate IV for telephone counselling [program code CHCAOD1C]). In addition, all staff received telephone counselling training delivered by *Lifeline* and specific cannabis use training and clinical supervision delivered by NCPIC. The annual *Lifeline* training consisted of a two day interactive workshop on suicide prevention training (the ‘Applied Suicide Intervention Skills Training’ course delivered by Living Works), and one annual day of a child protection
refresher course delivered by ‘Keeping Them Safe’. In addition, all counsellors had completed the ‘Lifeline Harbour to Hawkesbury Telephone Counselling Training Course’ (a total of 14, three-hour courses). The NCPIC training consisted of an initial full day training course on motivational interviewing techniques followed by three separate full day courses regarding cannabis myths and facts (entitled “Everything you need to know about cannabis”) delivered over two years.

**STUDY ONE – THE CIH PROCESS EVALUATION**

The CIH process evaluation was conducted to describe the nature of the helpline and the characteristics of the CIH callers. More specifically, this study aimed to determine: 1) who calls the CIH and why they call, and 2) what happens during the calls. This information will establish how well the CIH is positioned to assist in the delivery of a brief cannabis intervention. Notably, according to the National Business Development Manager at *Lifeline* Australia, the staff were willing to provide an evidence-based cannabis intervention (T. Fox, personal communication, 23 October, 2008). Ideally, the process evaluation would confirm that the service receives calls at least weekly from people interested in reducing their cannabis use and is capable of providing these callers information, counselling or referrals as appropriate.

**Methods and procedure**

*“CIH LIFE” - The Cannabis Information and Helpline dataset*

Following each call to the CIH, the answering counsellor recorded the content of the call into a database system called “CIH LIFE” (Appendix A shows a hardcopy of the document used by counsellors to collect the information entered into this database - referred to as the ‘Call Sheet’). This information was then reviewed by the supervisor.
on duty. The CIH LIFE database was modelled on the database kept by *Lifeline*, which was developed in a consultation process between several *Lifeline* centres. Additional cannabis specific questions were included into the database through collaboration with NCPIC.

Specifically, the CIH LIFE database consisted of:

- Administrative details (including a client identification number, where the caller heard about the helpline, as well as the date, time and duration of the call)
- Demographic details (including age, postcode, gender, marital status, employment status, living arrangement, and Aboriginal or Torres Strait Islander status)
- The reason for the call (the main issue and if the call involved counselling)
- Details regarding the caller’s cannabis use (including age of initiation, frequency of use, duration of use, treatment history, past reduction attempts)
- Details regarding the caller’s mental health (including treatment history and presentation of emotional health concerns)
- Details regarding what actions were taken by the counsellor during the call (including if they offered a referral, or clarified an issue for the caller, etc.)
- Details regarding the counselling process (that is, which of thirteen different aspects of MI and CBT were utilised during the call, such as: reflecting, reframing, open questioning, exploring, etc.). These particular aspects were selected to represent the client focused, non-directive Rogerian counselling model as trained by *Lifeline* centres in accordance with *Lifeline* Australia’s minimum standards to telephone counselling (P. Jesse, personal communication, 22 March, 2011)
- If the caller sounded satisfied with their call or not
- How the counsellor felt at the end of the call (including if they felt frustrated, tired, uplifted, challenged, etc.)
- A “caller story” where the counsellor could provide a short summary of the call

Given the difficulties inherent in surveying clientele who do not expect to be questioned (and can terminate the call at any time) there was a considerable amount of missing data in the CIH LIFE database. In addition, there were occasions when the CIH counsellors did not have time to enter call information into the database between calls. In these instances the counsellor kept a record of the call by completing the less time intensive caller story. To reduce missing data, the caller story information was analysed by the candidate and the database was updated in retrospect when possible.

**Data Analysis Techniques**

The CIH LIFE data was collected from January 2008 to December 2010 and analyses were conducted using PASW Statistics 18, Release Version 18.0.0 (SPSS, Inc., 2009, Chicago, IL, [www.spss.com](http://www.spss.com)) with the exception of a single regression analyses which was interpreted using data from Joinpoint (version 3.0, distributed by the Statistical Methodology and Applications Branch and Data Modeling Branch, Surveillance Research Program, National Cancer Institute). Joinpoint was used in regards to estimating the regression coefficients (i.e. slopes and changes of the slopes) observed regarding call rates during a period where the helpline was advertised by radio. Joinpoint uses a statistical algorithm to define a best-fitting regression line through incidence data across time and determines the incidents where significant changes take place.\(^{677}\) Between groups comparisons of callers were conducted by independent t-tests, chi-square comparisons, and logistic regression. Non-parametric testing (independent-samples Mann-Whitney U Test) was utilised for non-normal data.

To address the large amount of missing data, it is stated how many cases were present in the database before the results for each variable are described.
Results

Call volume

A total of 6720 calls were answered between January 2008 and December 2010 (assuming no variance in call rates per week, this call frequency translates to 43 calls per week). As can be seen in Figure 4.0, the number of calls to the helpline was not evenly spread throughout the three years. Three fluctuations in call rates are notable in this graph. Firstly, in February 2008 there was a spike in calls due to the public awareness raising media concerning the CIH commencing operations. Secondly, call rates were affected greatly by a radio advertisement campaign (a short 30-second message broadcasted a total of 200 times from 339 radio stations across Australia) during March 15 to June 28, 2009. In this peak period, the largest call volume was received in April with 495 calls, or an average of approximately 124 calls per week. Thirdly, there was a significant overall increase in the calls received in 2008 compared to the number of calls received in 2010 (p<0.001). This is likely to reflect a function of increasing awareness of the service.

Figure 4.0 Number of calls received by the CIH during January 2008 to December 2010
Results from a Joinpoint analysis of the call rates showed that the spike in call rates observed during the advertising period was statistically significant and resulted in an increase at an approximate rate of 110.02 (SD= 22.61) calls per month (Z=4.87, \( p<0.001 \)), which then began to decrease significantly at an approximate rate of 113.64 calls per month (SD=45.22, Z=−2.51, \( p<0.02 \)) before levelling off in August, 2009, and beginning a non-significant (\( p=0.4 \)) trend to increase at a slope of 1.63 calls per month.

Although the service answered 6720 calls, one quarter (25.5%) of these calls were identified as: hang ups/nuisance/abusive/hoax calls (\( n=1256 \)); calls that were outside of the scope of the CIH or unrelated to cannabis (\( n=40 \)); return calls (from answering machine messages) made by the CIH staff that were unanswered (\( n=71 \)); or calls where no data was recorded as the caller just wanted to know the hours of operation (\( n=252 \)), or were calling for Lifeline or NCPIC staff (\( n=97 \)). The number of calls removed from the database due to lack of content, detailed by month and year of operation, are shown in Figure 4.1.

![Figure 4.1 Number of hang ups, nuisance, abusive, or hoax (non-genuine) calls received by the CIH during January 2008 to December 2010](image-url)
With these calls with no content removed, 5004 “genuine calls” remained. Thus, assuming no variance in call rates per week, the helpline answered 32 genuine calls each week throughout January 2008 to December 2010. The analyses and results depicted in this process evaluation refer only to genuine calls.

Types of Callers to the CIH

Three different types of CIH callers were identified among the genuine callers. Firstly, the largest group of callers were individuals calling about a concern they had regarding their own cannabis use (hereby referred to as the ‘self-concern group’) \((n=2421, \text{ or } 48.4\% \text{ of genuine calls})\). Secondly, a slightly smaller group of callers were those calling in regards to another individual’s use (hereby referred to as the ‘others-concern group’) \((n=1916, \text{ or } 38.3\% \text{ of genuine calls})\). Finally, the remaining group of callers did not express a concern regarding their cannabis use or another person’s use, but were interested in cannabis-related information (hereby referred to as the ‘information group’) \((n=667, \text{ or } 13.3\% \text{ of genuine calls})\). The information group were typically health workers ordering brochures for their client groups \((n=409; 61.3\%)\), and less commonly other information seekers \((n=224; 33.6\%)\), or students asking a question for a school assignment \((n=33; 4.9\%)\).

Caller demographics

The CIH LIFE demographic questions were adapted from the demographic and social indicator items from the Australian National Minimum Data Set for Clients of Alcohol and Other Drug Treatment Services (NMDS-AODTS)\textsuperscript{301} and include: age, sex, marital status, Indigenous status, source of income, and living arrangement. The CIH LIFE database included these items to match those collected by all publicly funded drug or alcohol treatment agencies which are mandated to collect these data elements.\textsuperscript{301} Caller
responses to these questions are detailed in Table 4.1, depicted by caller type. The total number of cases where information was provided is indicated throughout.

Table 4.1 Demographic details of callers to the CIH depicted by caller type

<table>
<thead>
<tr>
<th>Demographic detail</th>
<th>Information group %</th>
<th>Self-concern group %</th>
<th>Others-concern group %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (n=4892)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>70.7</td>
<td>37.9</td>
<td>75.5</td>
<td>56.5</td>
</tr>
<tr>
<td>Male</td>
<td>29.3</td>
<td>62.1</td>
<td>24.5</td>
<td>43.5</td>
</tr>
<tr>
<td>Marital status (n=3536)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married and/or de facto</td>
<td>43.1</td>
<td>34.9</td>
<td>65.1</td>
<td>48.1</td>
</tr>
<tr>
<td>Divorced/separated/widowed</td>
<td>18.5</td>
<td>20.5</td>
<td>24.3</td>
<td>22.1</td>
</tr>
<tr>
<td>Never married</td>
<td>38.5</td>
<td>44.6</td>
<td>10.6</td>
<td>29.8</td>
</tr>
<tr>
<td>Living arrangement (n=3709)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>20.0</td>
<td>33.9</td>
<td>11.8</td>
<td>24.0</td>
</tr>
<tr>
<td>With family</td>
<td>71.1</td>
<td>54.7</td>
<td>83.3</td>
<td>67.4</td>
</tr>
<tr>
<td>With others</td>
<td>8.9</td>
<td>11.5</td>
<td>4.9</td>
<td>8.6</td>
</tr>
<tr>
<td>ATSI status (n=2681)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Indigenous</td>
<td>95.5</td>
<td>96.5</td>
<td>98.0</td>
<td>97.1</td>
</tr>
<tr>
<td>ATSI</td>
<td>4.5</td>
<td>3.5</td>
<td>2.0</td>
<td>2.9</td>
</tr>
<tr>
<td>Employment status (n=3973)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>88.0</td>
<td>52.7</td>
<td>69.8</td>
<td>62.9</td>
</tr>
<tr>
<td>Not in the workforce</td>
<td>12.0</td>
<td>47.3</td>
<td>30.2</td>
<td>37.1</td>
</tr>
</tbody>
</table>

"ATSI”=Aboriginal and/or Torres Strait Islander

Data was available regarding the caller’s age for 3679 (73.5%) of the genuine callers. The average, median and range of ages for these callers are presented in Table 4.2, depicted by caller type.

Table 4.2 Caller age depicted by caller type

<table>
<thead>
<tr>
<th>Age, in years</th>
<th>Information group (n=284)</th>
<th>Self-concern group (n=2020)</th>
<th>Others-concern group (n=1374)</th>
<th>Total (n=3679)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>36.92 (12.25)</td>
<td>34.60 (10.12)</td>
<td>44.57 (13.53)</td>
<td>38.50 (12.59)</td>
</tr>
<tr>
<td>Median</td>
<td>37</td>
<td>34</td>
<td>45</td>
<td>37</td>
</tr>
<tr>
<td>Range</td>
<td>13 - 71</td>
<td>13 – 76</td>
<td>12 – 90</td>
<td>12 – 90</td>
</tr>
</tbody>
</table>

The self-concern group was approximately five times more likely to be male than all other callers ($\chi^2=658.30, p<0.001, OR=4.74[4.18-5.35]$). Female callers were shown to be significantly ($t=9.14, p<0.001$) older than male callers (average age of 40.25 years [$SD=12.56$] compared to an average age of 36.47 years [$SD=12.31$]). In addition, the
others-concern group was significantly \((t=24.31, \ p<0.001)\) older than other caller groups \((mean=44.57 \text{ years}, \ [SD=13.53] \text{ compared to } 34.89 \text{ years } [SD=10.43])\). A logistic regression was performed to determine if caller gender interacted with caller type in predicting variance of caller age. This model, including caller gender, a dummy variable representing the information group and other callers, and a dummy interaction variable, explained a significant proportion of variance in caller age \((R^2=0.14, F_{3,3635}=194.19, \ p<0.001)\). The interaction variable and caller gender were non-significant \((p=0.5 \text{ and } p=0.2 \text{ respectively})\). Thus, controlling for gender, being part of the information group significantly predicted an increase in caller age \((\beta=0.39, t_{3635}=7.92, \ p<0.001)\).

Data was available regarding the callers’ postcode for 3894 (77.8%) of the genuine calls. Each state and territory of Australia contributed at least twenty calls between 2008 and 2010 to the CIH dataset. Calls most commonly originated from New South Wales \((n=1719; 44.1\%)\), and less commonly from: Victoria \((n=907; 23.3\%)\), Queensland \((n=657; 16.9\%)\), South Australia \((n=237; 6.1\%)\), Western Australia \((n=260; 6.7\%)\), Tasmania \((n=91; 2.3\%)\), and the Northern Territory \((n=23; 0.6\%)\). A list of postcodes based on the Accessibility/Remoteness Index of Australia (a measure of distance from service centre areas with 1,000 persons as a minimum) was used to identify participant postcodes as ‘major cities’ (unrestricted access to goods and services and opportunities for social interaction), ‘inner regional areas’ (restricted accessibility), ‘outer regional’ (significantly restricted accessibility) ‘remote’ (very restricted accessibility) or ‘very remote’ (very little accessibility).\(^{678,679}\) According to this segregation, the majority of calls originated from major cities (74.9%), and calls originating in inner regional Australia (18.1%), outer regional Australia (6.1%), or from remote and very remote areas (0.7% and 0.1% respectively) were rare in comparison. The frequency of calls
from these locations appeared to be closely related to the proportion of the population living in these areas. That is, in 2010, 68.6% of the Australian population lived in major cities, while the proportion living in inner regional (19.7%), outer regional (9.4%), remote (1.5%), and very remote (0.8%) areas was comparatively low.680

Duration of genuine calls answered

Data was available regarding the call duration for almost every genuine call \((n=4980, 99.5\%)\). The statistics concerning call duration are presented in Table 4.3 depicted by caller type.

<table>
<thead>
<tr>
<th>Call duration in minutes</th>
<th>Information group ((n=666))</th>
<th>Self-concern group ((n=2405))</th>
<th>Others-concern group ((n=1909))</th>
<th>Total ((n=4980))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>6.32 (6.70)</td>
<td>22.42 (15.75)</td>
<td>21.20 (15.31)</td>
<td>19.80 (15.62)</td>
</tr>
<tr>
<td>Median</td>
<td>4.0</td>
<td>20.0</td>
<td>18.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Range</td>
<td>(&lt; 1 – 65)</td>
<td>(&lt; 1 – 126)</td>
<td>(&lt; 1 – 100)</td>
<td>(&lt; 1 – 126)</td>
</tr>
</tbody>
</table>

As call duration data was not normally distributed, non-parametric testing was used to analyse this variable. No significant difference in call duration between males and females was found \((p=0.5)\). Further non-parametric testing showed that call duration for the self- and other-concern groups combined was significantly greater than for the information group \((p<0.001)\) and, in turn, call duration was significantly greater for the self-concern group compared to the other-concern group \((p=0.011)\).

How the callers first heard about the CIH service

Data regarding how the caller had heard of the CIH service before calling was available for over half of the genuine calls \((n=3288; 65.7\%)\). Approximately one quarter \((26.1\%)\) of CIH callers were introduced to the services by media advertisements (this reduced to 15.3% of calls taken outside the radio advertisement period). Other common referrals
came from: the NCPIC website (14.1%); health professionals (9.9%); drug and alcohol treatments (9.8%); family or friends (5.2%); brochures (5.2%); the Lifeline website (2.1%); and ‘other advertisements’ (27.6% - the CIH LIFE database did not include any further description for this selection).

Details regarding the callers’ cannabis use

Data regarding cannabis use frequency was available for the majority of the self-concern group (n=2014, 83.2%). The majority were smoking daily or near daily (86.5%) and less commonly smoked weekly (7.1%), or less often than weekly (6.4%).

Data regarding cannabis use history was available for over three quarters of the self-concern group (n=1912; 79.0%). The majority had been smoking for more than 10 years (58.6%), with fewer smoking six to 10 years (17.6%), one to five years (15.2%) or less than a year (8.6%).

Data regarding the age of initiation to cannabis use was available for just over half of the self-concern group (n=1357; 56.1%). These callers reported an average initiation age of 17.19 years (SD=4.63, range=6-53) and a median age of 16 years.

Data regarding previous attempts to reduce cannabis use was available for the majority of the self-concern group (n=1836; 75.8%). Just over two thirds (68.1%) reported having tried to cut down their use, and one third had previously sought treatment (30.8%) to assist their reduction attempts.

The specific cannabis-related concern that brought the self-concern group to call the service was recorded for approximately one fifth (n=429; 17.8%) of this group. These concerns were regarding: emotional concerns (24.2%), loss of control over cannabis use (20.0%), partner related problems (11.6%), health problems (10.7%), financial problems
(10.0%), problems at work (4.4%), and any other problem including child custody concerns and other legal issues (14.8%). Finally, data was available regarding whether or not the self-concern group had a concern regarding another drug or alcohol for two thirds of the group (n=1598; 66.0%). Under half (40.5%) mentioned having a concern regarding other drug or alcohol use although no further detail was recorded.

**Concerns held by the others-concern group**

Data was available for the majority (n=3016; 60.3%) of the others-concern group regarding their relationship with the individual of concern and the reason for their call. The majority of the others-concern group shared a concern for their own child (47.2%), or partner (25.5%), and less commonly their friend or colleague (8.6%), sibling (5.0%), client (4.4%), extended family (including niece or nephew, grandchildren, or relatives in law; 4.7%), neighbour (2.1%), parent (0.4%), employee (0.4%), or student (0.4%), with few not disclosing the individual’s identity (4.4%). The most common concern was regarding this individual’s loss of control over cannabis use (25.5%). Other less common concerns included: mental health concerns (12.9%), behaviour problems (10.3%), relationship problems (8.2%), physical health concerns (7.8%), problems with family (7.2%), problems with employment (7.0%), a need for information or brochures (4.7%), legal problems (3.3%), financial problems (2.7%), or any other problem (4.0%). In addition, a handful of callers were not able to identify a particular main concern but reported many different concerns (6.4%).

**Mental health of the caller**

Data regarding the mental health state of callers was available for approximately one fifth of genuine calls (n=1023; 20.4%). The percentages of types of health issues expressed by callers are depicted in Table 4.4, detailed by caller type.
Table 4.4 Mental health concerns of genuine callers to the CIH, detailed by caller type

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Information group (n=110) %</th>
<th>Self-concern group (n=629) %</th>
<th>Others-concern group (n=289) %</th>
<th>Total (n=1023) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>6.4</td>
<td>44.9</td>
<td>9.0</td>
<td>30.6</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.9</td>
<td>32.6</td>
<td>5.2</td>
<td>21.7</td>
</tr>
<tr>
<td>Feeling alone</td>
<td>1.8</td>
<td>21.7</td>
<td>1.0</td>
<td>13.8</td>
</tr>
<tr>
<td>Unstable mood</td>
<td>0.0</td>
<td>11.0</td>
<td>2.8</td>
<td>7.5</td>
</tr>
<tr>
<td>Traumatic experience</td>
<td>0.0</td>
<td>8.6</td>
<td>2.8</td>
<td>6.1</td>
</tr>
<tr>
<td>Suicidal thoughts</td>
<td>0.0</td>
<td>9.1</td>
<td>0.7</td>
<td>5.8</td>
</tr>
<tr>
<td>Hearing voices</td>
<td>0.0</td>
<td>7.3</td>
<td>2.1</td>
<td>5.1</td>
</tr>
<tr>
<td>Experiencing loss</td>
<td>0.0</td>
<td>7.7</td>
<td>0.0</td>
<td>4.7</td>
</tr>
<tr>
<td>Self-harming</td>
<td>0.0</td>
<td>2.4</td>
<td>0.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Eating problems</td>
<td>0.0</td>
<td>2.1</td>
<td>0.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Other mental health problems</td>
<td>0.9</td>
<td>10.1</td>
<td>2.4</td>
<td>6.9</td>
</tr>
<tr>
<td>Any mental health problem</td>
<td>7.3</td>
<td>69.0</td>
<td>14.9</td>
<td>47.2</td>
</tr>
</tbody>
</table>

Chi-square analysis was used to determine if the self-concern group was more likely to express any of the mental health concerns than other callers and is presented in Table 4.5. As shown, the self-concern group was statistically significantly more likely to express each mental health concern compared to all other callers.

Table 4.5 Significance testing regarding expression of mental health concerns between self-concern group and other callers

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Comparison between self-concern group and other callers ($\chi^2$)</th>
<th>Odds Ratio (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>153.76***</td>
<td>9.03 (6.12 - 13.34)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>114.50**</td>
<td>10.78 (6.45 - 18.01)</td>
</tr>
<tr>
<td>Family concerns</td>
<td>39.91***</td>
<td>4.18 (2.60 - 6.71)</td>
</tr>
<tr>
<td>Feeling alone</td>
<td>85.86***</td>
<td>21.82 (8.85 - 53.78)</td>
</tr>
<tr>
<td>Unstable mood</td>
<td>28.25***</td>
<td>6.01 (2.86 - 12.65)</td>
</tr>
<tr>
<td>Traumatic experience</td>
<td>9.61**</td>
<td>7.19 (1.68 - 30.76)</td>
</tr>
<tr>
<td>Suicidal thoughts</td>
<td>33.07***</td>
<td>19.79 (4.80 - 81.51)</td>
</tr>
<tr>
<td>Hearing voices</td>
<td>17.16***</td>
<td>5.17 (2.19 - 12.22)</td>
</tr>
<tr>
<td>Experiencing loss</td>
<td>#</td>
<td>#</td>
</tr>
<tr>
<td>Self-harming</td>
<td>7.26**</td>
<td>9.72 (1.28 - 73.89)</td>
</tr>
<tr>
<td>Eating problems</td>
<td>4.16*</td>
<td>4.19 (0.94 - 18.66)</td>
</tr>
<tr>
<td>Other problems</td>
<td>24.37***</td>
<td>5.44 (2.58 - 11.48)</td>
</tr>
</tbody>
</table>

***p<0.001, ** p<0.01, *p<0.05

# “Experiencing loss” was expressed in the self-concern group but was not expressed in the others-concern or information group and so a Chi Square analysis was not appropriate
Caller thoughts of suicide

The counsellors recorded the presence or absence of caller suicidal thoughts for one fifth \( (n=1023; 20.4\%) \) of the genuine calls. No caller from the information group expressed thoughts of suicide, although two callers (0.7\%) from the others-concern group expressed such thoughts. In contrast, almost one in ten (9.1\%) of the self-concern group reported thoughts of suicide. Further detail of these suicidal thoughts were recorded for just under one third of those expressing suicidal thoughts \( (n=16; 27.1\%) \). From this group, it was rare for callers to mention having a plan of how to carry out the suicide (18.8\%), although approximately one third (31.3\%) had reportedly attempted suicide in the past. Those callers with a plan to carry out suicide were assessed to determine the risk of suicide and were supported by the CIH counsellors to contain any crisis. If necessary the counsellors were able to refer the caller to a crisis support team, however, this outcome was not reported to have occurred during the data collection period.

Caller history of mental health treatment and use of medications

The counsellors recorded information regarding the history of mental health treatments for one fifth of the self- and other-concern groups \( (n=914; 21.1\%) \). As detailed in Table 4.6, callers had not commonly accessed treatment regarding their mental health in the past, with the exception of treatment for depression.
Table 4.6 Percentage of callers reporting past access to professional mental health services, depicted by the self- and others-concern caller types

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Self-concern group (n=625) %</th>
<th>Others-concern group (n=289) %</th>
<th>Total (n=914) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression treatment</td>
<td>27.5</td>
<td>5.2</td>
<td>20.5</td>
</tr>
<tr>
<td>Bipolar treatment</td>
<td>17.1</td>
<td>0.3</td>
<td>11.8</td>
</tr>
<tr>
<td>Anxiety treatment</td>
<td>14.9</td>
<td>2.4</td>
<td>11.0</td>
</tr>
<tr>
<td>Schizophrenia treatment</td>
<td>11.0</td>
<td>1.7</td>
<td>8.1</td>
</tr>
<tr>
<td>PTSD Treatment</td>
<td>3.4</td>
<td>0.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Other treatments</td>
<td>2.7</td>
<td>1.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Personality disorder treatment</td>
<td>2.1</td>
<td>0.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Dementia treatment</td>
<td>0.2</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Eating disorder treatment</td>
<td>0.3</td>
<td>0.0</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Chi-square analysis was utilised to determine if the self-concern group was more likely than the others-concern group to have accessed any particular mental health service in the past and is reported in Table 4.7. As shown, the self-concern group was statistically significantly more likely to have accessed depression, bipolar disorder, anxiety and schizophrenia treatment compared to the others-concern group.

Table 4.7 Significance testing regarding past access of mental health treatment between the self- and others-concern caller types

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Comparison between self- and others-concern groups (χ²)</th>
<th>Odds Ratio (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression treatment</td>
<td>60.55*</td>
<td>6.94 (4.01 – 12.00)</td>
</tr>
<tr>
<td>Bipolar treatment</td>
<td>53.36*</td>
<td>59.49 (8.26 – 428.45)</td>
</tr>
<tr>
<td>Anxiety treatment</td>
<td>31.551*</td>
<td>7.06 (3.23 – 15.42)</td>
</tr>
<tr>
<td>Schizophrenia treatment</td>
<td>23.02*</td>
<td>7.05 (2.81 – 17.67)</td>
</tr>
<tr>
<td>PTSD Treatment</td>
<td>#</td>
<td>#</td>
</tr>
<tr>
<td>Other treatments</td>
<td>ns (p=0.106)</td>
<td>-</td>
</tr>
<tr>
<td>Personality disorder treatment</td>
<td>ns (p=0.125)</td>
<td>-</td>
</tr>
<tr>
<td>Dementia treatment</td>
<td>ns (p=0.576)</td>
<td>-</td>
</tr>
<tr>
<td>Eating disorder treatment</td>
<td>#</td>
<td>#</td>
</tr>
</tbody>
</table>

“PTSD” = Post Traumatic Stress Disorder; “ns” = non-significant

*p < 0.001

# This treatment was sought by the self-concern group but was not sought by other callers and so a Chi Square analysis was not appropriate

Data was available for approximately one fifth (n=917; 21.1%) of the self- and others-concern group regarding whether or not they were taking any medications, or were
under the care of a health professional, at the time of the call. Approximately one
quarter \((n=246;\ 26.8\%)\) were taking a medication at the time of their call, although no
further detail was recorded. In addition, approximately one third \((n=300;\ 32.7\%)\)
reported that they were under the care of a health professional. From this subsample, the
callers most commonly reported being under the care of their general practitioner
\((50.0\%)\) or psychiatrist \((33.3\%)\) and less commonly under the care of their psychologist
\((10.0\%)\) or any other health professional \((6.7\%)\).

*Actions taken by CIH counsellors*

Data was available regarding which of a series of counsellor initiated actions took place
during each call for the majority of genuine calls \((n=4301;\ 86.0\%)\). The actions
included in the CIH LIFE database and the total number and percentage of calls in
which they occurred are detailed in Table 4.8 below, depicted by caller type (the
information group typically only involved the provision of education).

Table 4.8 Actions taken by CIH counsellors during calls between 2008 and 2010, depicted by the
self- and others-concern caller types

<table>
<thead>
<tr>
<th>Action taken by the counsellor</th>
<th>Self-concern group ((n=2404)) %</th>
<th>Others-concern group ((n=1897)) %</th>
<th>Total ((n=4301)) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contained a crisis</td>
<td>2.6</td>
<td>1.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Clarified an issue</td>
<td>92.7</td>
<td>91.6</td>
<td>92.2</td>
</tr>
<tr>
<td>Explored coping mechanisms</td>
<td>81.0</td>
<td>78.2</td>
<td>79.8</td>
</tr>
<tr>
<td>Offered emotional support</td>
<td>80.0</td>
<td>78.5</td>
<td>79.3</td>
</tr>
<tr>
<td>Encouraged caller to communicate with friends and family</td>
<td>41.5</td>
<td>44.8</td>
<td>43.0</td>
</tr>
<tr>
<td>Encouraged caller to continue seeing their current health professional</td>
<td>36.8</td>
<td>31.3</td>
<td>34.4</td>
</tr>
<tr>
<td>Assessed suicide risk and/or safety</td>
<td>7.7</td>
<td>5.5</td>
<td>6.8</td>
</tr>
<tr>
<td>Consulted with the <em>Lifeline</em> Service Finder database</td>
<td>7.2</td>
<td>8.4</td>
<td>7.8</td>
</tr>
</tbody>
</table>

Chi-square analysis was utilised to determine if there was any statistically significant
difference between the self- and others-concern groups regarding the proportion of calls
where a particular action was taken by the counsellor and is detailed in Table 4.9. As shown, although many of the actions the counsellor employed were statistically significantly more likely to be with the self-concern callers than the others-concern group, the odds ratios depicted indicate that these differences were small.

Table 4.9 Significance testing regarding actions taken by the counsellor between the self-concern group and other callers

<table>
<thead>
<tr>
<th>Action taken by the counsellor</th>
<th>Comparison between self- and others-concern groups ($\chi^2$)</th>
<th>Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contained a crisis</td>
<td>ns ($p=0.115$)</td>
<td>-</td>
</tr>
<tr>
<td>Clarified an issue</td>
<td>ns ($p=0.180$)</td>
<td>-</td>
</tr>
<tr>
<td>Explored coping mechanisms</td>
<td>5.17*</td>
<td>1.19 (1.02 – 1.38)</td>
</tr>
<tr>
<td>Offered emotional support</td>
<td>4.66*</td>
<td>1.10 (0.95 – 1.27)</td>
</tr>
<tr>
<td>Encouraged caller to communicate with friends and family</td>
<td>4.66*</td>
<td>0.88 (0.78 – 0.99)</td>
</tr>
<tr>
<td>Encouraged caller to continue seeing their current health professional</td>
<td>14.33***</td>
<td>1.28 (1.13 – 1.45)</td>
</tr>
<tr>
<td>Assessed suicide risk and/or safety</td>
<td>7.95**</td>
<td>1.43 (1.11 – 1.83)</td>
</tr>
<tr>
<td>Consulted with the Lifeline Service Finder database</td>
<td>ns ($p=0.135$)</td>
<td>-</td>
</tr>
</tbody>
</table>

*ns” = non-significant; *$p<0.05$, **$p<0.01$, ***$p<0.001$

The counsellors also reported on what the outcome was from the action they had taken. The outcomes recorded and the percentage of calls in which they occurred are detailed in Table 4.10.

Table 4.10 Outcomes recorded by the counsellors during calls, depicted by caller type

<table>
<thead>
<tr>
<th>Call outcome</th>
<th>Self-concern group (n=2413) %</th>
<th>Others-concern group (n=1906) %</th>
<th>Total (n=4319) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caller was able to identify their issues</td>
<td>78.3</td>
<td>80.8</td>
<td>79.4</td>
</tr>
<tr>
<td>Caller identified an option to pursue</td>
<td>64.3</td>
<td>59.8</td>
<td>62.3</td>
</tr>
<tr>
<td>Caller made a contract to call back</td>
<td>19.1</td>
<td>18.4</td>
<td>18.8</td>
</tr>
<tr>
<td>Caller made a contract to keep safe</td>
<td>6.0</td>
<td>3.9</td>
<td>5.1</td>
</tr>
</tbody>
</table>

Chi-square analysis was utilised to determine if there was any statistically significant difference between the self- and others-concern groups and the percentage of calls where a particular call outcome occurred. This analysis is detailed in Table 4.11. The others-concern group was statistically significantly more likely to report identifying
their issue of concern; however, the self-concern group was more likely to identify an option to pursue, and to make a contract with the counsellor to avoid self-harming.

Table 4.11 Significance testing regarding call outcomes between the others-concern group and other callers

<table>
<thead>
<tr>
<th>Call outcome</th>
<th>Comparison between others- and self-concern callers ($\chi^2$)</th>
<th>Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caller was able to identify their issues</td>
<td>4.11*</td>
<td>0.86 (0.74 – 1.00)</td>
</tr>
<tr>
<td>Caller identified an option to pursue</td>
<td>9.18**</td>
<td>1.21 (1.07 – 1.37)</td>
</tr>
<tr>
<td>Caller made a contract to call back</td>
<td>ns ($p=0.551$)</td>
<td>-</td>
</tr>
<tr>
<td>Caller made a contract to keep safe</td>
<td>9.28**</td>
<td>1.55 (1.17 – 2.07)</td>
</tr>
</tbody>
</table>

“ns” = non-significant; *$p<0.05$, **$p<0.01$

Referrals to formal support

Due to technical issues, the CIH LIFE database was unable to provide information regarding whether or not a particular caller was referred to other professional support during November to December 2008, and June to December 2009 (a total of 1326 calls). Data regarding caller referrals was available for the remaining genuine calls ($n=3678$). From these calls, just under half ($n=1569$; 42.7%) of calls involved at least one referral being made. The vast majority (88.1%) of these referrals were made to other drug or alcohol services. The remaining referrals were to services regarding: family and relationships (2.9%); child protection or domestic violence (2.5%); mental health and well-being (2.7%); physical health/medical services (1.4%); legal advice (1.1%); or any other referral (1.3%). In one third (34.6%) of the cases where a referral was made, two referrals were given, and one in ten (10.1%) cases involved three referrals (the CIH LIFE dataset could not specify if more than three referrals were made).
Motivational interviewing and cognitive behavioural techniques used during calls

The CIH counsellors were asked to record which of thirteen different responses or actions were utilised during each call. Of interest were a total of seven components of counselling stemming from aspects of motivational interviewing (MI) and four components from aspects of cognitive behavioural therapy (CBT). The frequency to which these eleven components were employed is presented in Table 4.12 below (the information group typically did not involve any counselling and was not applicable).

The two responses that were not included in the table referred to “listening to the caller”, and “asking closed-ended questions.” These two options were instead considered to be common aspects of a telephone conversation rather than particular counselling techniques.

Table 4.12 Motivational interviewing and cognitive behavioural therapy techniques utilised by counsellors during calls to the CIH

<table>
<thead>
<tr>
<th></th>
<th>Self-concern group (n=2382) %</th>
<th>Others-concern group (n=1882) %</th>
<th>Total (n=4264) %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivational interviewing components</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflective listening to clarify meaning and encourage exploration</td>
<td>86.0</td>
<td>83.8</td>
<td>85.0</td>
</tr>
<tr>
<td>Asking open ended questions</td>
<td>92.3</td>
<td>91.2</td>
<td>91.8</td>
</tr>
<tr>
<td>Evoking change talk – grounding the caller or keeping the focus on change talk</td>
<td>49.7</td>
<td>47.4</td>
<td>48.7</td>
</tr>
<tr>
<td>Evoking change talk - summarising elements of the caller’s conversation to link together or reinforce change talk</td>
<td>70.9</td>
<td>69.3</td>
<td>70.2</td>
</tr>
<tr>
<td>Paraphrasing the conversation to clarify meaning</td>
<td>32.8</td>
<td>33.3</td>
<td>33.0</td>
</tr>
<tr>
<td>Exploring the importance and confidence to change</td>
<td>68.6</td>
<td>69.9</td>
<td>69.2</td>
</tr>
<tr>
<td>Providing affirmations</td>
<td>54.0</td>
<td>53.8</td>
<td>53.9</td>
</tr>
<tr>
<td><strong>Cognitive behavioural techniques</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive reframing (offering more adaptive thinking to a caller with maladaptive thinking)</td>
<td>53.0</td>
<td>46.6</td>
<td>50.2</td>
</tr>
<tr>
<td>Identifying distorted thinking or thinking errors</td>
<td>24.4</td>
<td>19.8</td>
<td>22.4</td>
</tr>
<tr>
<td>Clarifying the caller’s concerns</td>
<td>9.3</td>
<td>8.2</td>
<td>8.8</td>
</tr>
<tr>
<td>Behavioural contracting</td>
<td>5.1</td>
<td>2.9</td>
<td>4.1</td>
</tr>
</tbody>
</table>
A variable was created to represent the total number of counselling components that were utilised per call. Of the eleven considered components, the counsellors reported utilising an average of 4.9 components ($SD=2.6$, $median=6$). As this variable was not normally distributed, non-parametric testing was utilised to determine if the caller group statistically significantly impacted on the number of counselling components that were used per call. The counsellors of the self-concern group reported significantly more counselling components per call than did the counsellors of the others-concern group ($t=2.72$, $p=0.007$; $mean=5.45$, $SD=2.32$, and $mean=5.26$, $SD=2.33$, respectively).

Notably, each group reported a similar mean and as such this statistical difference may have reflected the large sample size compared to a meaningful real-world difference.

**Discussion**

Analysis of the CIH call data showed that the service answered over 5000 calls from January 2008 to December 2010, with approximately one in every two (48%) calls originating from an individual with a concern regarding their cannabis use. The CIH is one of a handful of Australian helplines which targets drug or alcohol concerns, but the only national helpline to tailor its services to a particular illicit drug. To highlight how the CIH distinguishes itself as appropriate for the delivery of a brief cannabis intervention, the origin, frequency and content of calls, and the caller profile is presented here and compared to Australian helplines in general, and the Victorian-based general substance use *DirectLine*.

**The frequency of calls**

The CIH received approximately 43 calls per week, and at its peak (during a radio advertising campaign) this call rate was tripled to approximately 124 calls per week. Of all non-profit mental health helplines in Australia, 43% of services reported answering
100 or less calls per week. As such, the average call rate to the CIH was comparable to less than half mental health telephone services, although the peak call rate was comparable to 57% of services. This call frequency, although below that of mental health services, was promising as the service was newly established and targeted a smaller population of those with cannabis-related concerns compared to mental-health concerns. Unfortunately, no national data is available to make a direct comparison with an Australian substance use helpline; however, state-based data is available. Specifically, DirectLine, a substance use helpline operating in Victoria, has reported state-based data on call rates. In 2001, DirectLine was temporarily servicing the Northern Territory and Tasmania, in addition to Victoria, and reportedly received a total of 55,454 calls. A second study regarding the drug treatment referral function to DirectLine, reported that approximately 16% of all calls were regarding cannabis use concerns. Assuming the information from these studies can be combined, the data infers that DirectLine answers an approximate average of 175 calls per week regarding cannabis use concerns. As such, the CIH service was comparable to DirectLine only when at its peak period during the advertising period of four months.

The impact of media campaigns involving television and radio advertising has been previously evaluated among tobacco specific helplines in England, the US, and Australia. In each case, media advertisements statistically significantly improved call rates. As such, it can be inferred that, while the CIH did not typically receive a relatively high call rate, this was significantly associated with the absence of widespread advertising. The advertising campaign used to promote the CIH was run for four months in 2009 for a total cost of $225,365 AUD. During this campaign the call rate increased by 110 calls per month for the first two months. The last two months of the campaign evidenced a slow decline back to the pre-advertising call rate. By comparing the number
of calls received in 2008 and 2010 during the same time period as the 2009 campaign, the advertising campaign appeared to account for an average increase of 559 and 760 calls, respectively. Considering the cost of advertising, the average of this increase in call frequency translates to $296.50 per additional call. This figure is somewhat comparable with the cost per additional call associated with a similar media campaign promoting a tobacco cessation helpline in the US ($215 USD).\(^{589}\) Compared with the cost of delivering a service, however, this figure was approximately twice the per-call cost of the CIH ($133 AUD during the advertising period),\(^{681}\) and the per-person cost of a screening and motivational interviewing-based intervention for alcohol use which was delivered face-to-face in a hospital emergency department ($173 USD).\(^{682}\) As such, the media advertising had a significant impact on call rate, but at a significant cost.

*The call duration and content*

The average call duration to the CIH was 20 minutes. It was unusual for calls to the service to continue for one hour or more (2% of calls), although one quarter (24%) of calls continued for at least half an hour. During these calls, the counsellors reported drawing from an average of over five separate counselling components based on motivational interviewing and cognitive behavioural techniques (most commonly asking open-ended questions and reflecting on responses). Notably, these components were self-reported and as such were limited by the recollection of the counsellors. The counsellors reported that the most common outcome regarding calls to the CIH was that the caller was able to identify their issues (79%) and an option to pursue (62%). Further, almost half (43%) of the genuine calls to the CIH involved at least one referral being made (88% of these referrals were made to other drug or alcohol services). The call duration, number of counselling components involved during the call, and rate of
referral each increased for callers concerned about their cannabis use in comparison to information calls in particular and, to a lesser extent, those with a concern about another’s cannabis use.

Unfortunately, no research on a specific substance use helpline has reported data on call duration or content. In comparison to two mental health helplines with available data, the reported call duration was comparable to the Kids Help Line (average of 18 minutes), but lower than Lifeline (average of 51 minutes). The counselling methods utilised, including motivational interviewing and cognitive behavioural treatment, were reportedly practiced by the majority (56%) of surveyed counsellors working in mental health helplines in Australia. The duration and counselling methods used by these services, however, should not be interpreted to reflect the quality of the service.

Finally, the rate of referral to drug and alcohol services by the CIH was comparable to the percentage of referrals made by DirectLine to drug or alcohol services (89%). This high proportion of referrals is unsurprising given that these telephone services could not provide an intervention for substance use outside of the original call.

Caller demographic profile and cannabis use status

Callers to the CIH were most commonly female (57% of total calls) in their late 30s (a median of 37 years). This caller description somewhat matches the majority of individuals seeking healthcare in general. That is, the profile matches services of mental health helplines in Australia (60-82% female, most commonly 25-40 years old), and those seeking general health information in America (most commonly by young, well-educated and employed females).
Notably, the age, gender, and levels of distress expressed by CIH callers were significantly moderated by the type of caller. That is, if the caller was concerned about their own cannabis use (48% of callers), the caller was approximately five times more likely to be male and typically a decade younger than callers with a simple information request, or with a concern regarding the cannabis use of another individual. This caller type reflected the profile of individuals calling DirectLine, where half (51%) of callers were male and the majority (64%) were older than 30 years. Moreover, face-to-face cannabis treatment seekers in Australia are most commonly male (although this observation appears to be diminishing among more recent cohorts of users) and aged between 20 to 29 years old. Finally, callers with a concern regarding their cannabis use were statistically significantly more likely than other callers to express a mental health condition (such as depression, borderline personality disorder, anxiety and schizophrenia). A total of 69% of these callers expressed a mental health issue which is a similar proportion to that which has been observed among daily cannabis users seeking cannabis use treatment (60%). In summary, it appeared as though the CIH callers represented individuals seeking assistance (younger males) or information (older females) from face-to-face services.

Implications and Conclusions

The CIH is a well-positioned service to provide a telephone-based brief intervention for individuals interested in reducing their cannabis use. Analysis of the CIH LIFE database supported this claim in three main ways. First, examination of the caller profiles to the CIH revealed a group of heavy cannabis using individuals – most commonly young males, who were never married, living alone and without employment. These callers frequently requested referral to further drug or alcohol treatment and appear comparable
to face-to-face cannabis treatment seekers. Thus, the CIH callers could potentially be interested in receiving a brief cannabis intervention without the need for contacting a separate service. Second, callers who used cannabis reported feeling depressed, anxious, and experienced other mental health concerns more frequently than non-users. The call content and duration for these callers reflected a sample in greater need of counselling and support compared to callers seeking information or education. As such, these callers may be particularly interested in a telephone-based intervention that would ideally attend to their mental health concerns in addition to their cannabis use. Third, the volume of calls to the CIH - at times more than one hundred in a week originating from each state and territory in Australia, with one quarter of callers living outside of inner city areas, implies that the CIH service has a greater reach across Australia than that of a single face-to-face service of 14 staff in a fixed location.

This process evaluation of the CIH service identified the potential for the CIH to deliver a proactive service to individuals interested in reducing their cannabis use. The present study, however, was limited to the CIH LIFE database and established only that the service received calls from cannabis treatment seekers and that these calls were associated with a greater duration and complexity in counsellor response compared to other caller types. As such, the longer-term outcome of the calls was outside the scope of this database. To address this gap, the following chapter details an impact study of the CIH where callers to the service were interviewed one week post-call. This study focused on caller satisfaction, and was conducted to determine the short term impact of, and caller satisfaction with, the CIH.
CHAPTER FIVE: EVALUATING THE IMPACT OF THE CANNABIS INFORMATION AND HELPLINE

OVERVIEW

The previous chapter established that the Cannabis Information and Helpline (CIH) provided a service frequently utilised by cannabis users and by their friends and family. The present chapter addresses whether the service was satisfying to its callers. This chapter details an empirical study of the CIH in which callers to the service were interviewed regarding their satisfaction with the service one week following their call. This study marked the first investigation of caller satisfaction to a national illicit drug helpline (hereby referred to as the ‘impact evaluation’). The impact evaluation was conducted to inform on the extent to which the CIH service is capable of attending to the needs of callers with cannabis-related concerns, and what aspects of the call content, or the caller, may predict satisfaction. The satisfaction or dissatisfaction of callers with the CIH was of interest for two primary reasons. First, the caller’s opinions spoke to the value of the CIH in general and specifically to deliver a telephone-based cannabis intervention. Second, the impact evaluation was designed to identify aspects of a telephone encounter that may predict satisfaction that could be incorporated into the development of the telephone-based intervention.

TREATMENT SATISFACTION IN HEALTH RESEARCH

Along with service quality (or the likelihood that a service produces desired outcomes and is consistent with current best practice), service accessibility and cost (to the client and service), an evaluation of a healthcare telephone service ideally includes an analysis

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iii A version of this chapter has been published in the Journal of Telemedicine and Telecare and is referenced in Appendix E
of the satisfaction of its callers. Unfortunately, client satisfaction in face-to-face healthcare has not been consistently defined. This has contributed to an ambiguity, and even contradictory results, across studies.\textsuperscript{686,687} Over the last two decades, however, the most predominant definition of satisfaction in the healthcare literature refers to an ‘expectation and disconfirmation’ model.\textsuperscript{686,687} This model stipulates that people have pre-conceived ideas or expectations that act as a standard by which actual performance can be measured as negative, neutral or positive (below, equal to, or above the standard), resulting in low, neutral, or high satisfaction, respectively.\textsuperscript{688,689}

**The utility of measuring satisfaction**

Measurement of a client’s perspectives and expectations of health care, particularly mental health care, was first established in the early 1980s, and the associated literature increased dramatically in the nineties.\textsuperscript{690,691} Client satisfaction is currently thought to be integral to any measurement of health service quality and is of great interest to funding bodies.\textsuperscript{686,687,692,693} The literature on client satisfaction is historically associated with evaluations of medical and mental health care service quality,\textsuperscript{687} although more recently its measurement has been applied in substance use treatment.\textsuperscript{694} In this respect, client satisfaction has been found to predict treatment utilisation,\textsuperscript{694-705} and retention.\textsuperscript{699,702,706-708} Client satisfaction also may be associated with better substance use treatment outcome,\textsuperscript{694,703,709,710} although this finding is not consistently reported\textsuperscript{459,699,711} and may reflect a more robust association between treatment retention and improved outcomes.\textsuperscript{695-697,711}

The predictive power of client satisfaction in regards to treatment utilisation and retention has resulted in its measurement being a staple in face-to-face health service quality assessment.\textsuperscript{686,687,712} Although the measurement of satisfaction is widespread,
the expanding use of this evaluative tool has been argued to be premature with evidence of inconsistencies and methodological issues in the literature on satisfaction.\textsuperscript{686, 687, 713, 714}

**Some concerns regarding the measurement of satisfaction**

By definition, client satisfaction relies on an individual’s pre-conceived standard, and depending on the individual, the same service could invoke high satisfaction or complete dissatisfaction. That is, what is satisfactory to one person (with low standards or expectations) may be unsatisfactory to another person (with high standards or expectations). This variance can contribute to problems aggregating results from satisfaction surveys.\textsuperscript{715, 716} In addition, satisfaction studies often suffer from methodological issues such as low response rates, problems reaching minority groups and poor questionnaire design.\textsuperscript{687, 713} A particular methodological concern when measuring satisfaction with alcohol and drug treatment services is that of a consistent reporting of high satisfaction with little variation in response regarding face-to-face services,\textsuperscript{709, 687, 711, 717, 718} and telephone-based services.\textsuperscript{570, 584, 650, 663} This is thought to be due to low expectations of treatment quality shared by alcohol or drug treatment seekers,\textsuperscript{311} and a shared community norm of being courteous toward a service offering help.\textsuperscript{714} Although there is typically little variation in responses to satisfaction questions, several factors are thought to predict the small changes in satisfaction ratings for both mental health and substance use treatments.

**Predictors of satisfaction with mental health treatments**

Research regarding the predictors of satisfaction with mental health treatment has been collated by systematic review and the importance of both the clientele and aspects of the service provider are highlighted.\textsuperscript{686, 687, 693, 719} That is, clientele reporting low satisfaction
are thought to be associated with: poor physical health, having a disability, low quality
of life, psychological distress, or being in the youngest age groups. Arguably the most
important aspect of a mental health service when predicting client satisfaction is the
clients’ perception of the service provider’s competence and concern for their well-
being, sometimes referred to as the working alliance. The working alliance is a
term coined in 1967, and is defined as “the collaborative and affective bond between
therapist and patient”. The working alliance is not only associated with client
satisfaction, but also has long been thought to be a necessary aspect of effective
psychotherapy in general, and a statistically significant predictor of treatment
outcome.

Predictors of satisfaction with substance use treatments

As with mental health treatments, aspects of both the client and the service are
important in predicting client satisfaction with substance use treatment. One aspect
particular to the treatment service that may be associated with satisfaction is
engagement with treatment. An in-depth evaluation of 71 face-to-face
substance use treatment services (including seven methadone maintenance, 33
outpatient, seven short- and 16 long-term residential and eight mandatory correctional
services) which included satisfaction ratings from 5,274 participants was conducted
between 1992 and 1995 as part of the US National Treatment Improvement Evaluation
Study (NTIES). In this study, greater client satisfaction was observed when the
number of treatment sessions increased (odds of satisfaction increased by 112% as the
number of weekly sessions increased from one to five or more sessions) and when the
length of treatment stay increased (odds of satisfaction increased by 3-7% with each
additional week). This finding should not take anything from the importance of
individualizing treatments by matching the level of service provision with the level of treatment need.\textsuperscript{701, 733-735} That is, ensuring a favourable ratio regarding the proportion of services received compared to services needed. In this way, services should ultimately avoid the provision of long-term treatment when brief short-term treatment may be more appropriate.\textsuperscript{733-735} Notably, there was some variation in satisfaction ratings between service types. Short-term residential treatments tended to have the highest proportion (80\%) of participants rating the service as “very helpful” compared to the lowest proportion rating methadone maintenance services this way (44\%). However, this finding was not consistent with further study of methadone clinics in Australia (nine clinics including 432 participants\textsuperscript{718}), Spain (20 clinics including 351 participants\textsuperscript{731}), or the US (one clinic including 142 participants\textsuperscript{732}) which reported strong global satisfaction scores averaging 3.8, 3.5, and 4.4 out of 5, respectively.

The client’s gender and age group also may be associated with variance in satisfaction ratings. In particular, women may report lower satisfaction than men for treatment services that do not attend to their unique treatment needs (including the need for child care services, or assistance with pregnancy and parenting).\textsuperscript{736-738} However, these factors can only partly explain the variance in satisfaction ratings between genders as services without these features also have been rated with greater satisfaction by women than men.\textsuperscript{732} Finally, in the NTIES review of substance use treatment services, individuals below the age of 18 years from all types of services reported significantly lower satisfaction with substance use treatment services compared to adults above the age of 40 years (49\% compared to 63\% reported the services to be “very helpful”).\textsuperscript{701}

Similar to mental health service treatments, a strong working alliance is a significant predictor of satisfaction with substance use treatment,\textsuperscript{727, 739-741} and treatment
outcomes. Yet, despite the recognition that client satisfaction and working alliance are important measures of service quality, and are utilised widely in face-to-face treatment settings, these measures are rarely utilised in evaluations of telephone-based treatments.

TELEPHONE SATISFACTION STUDIES

Telephone-based counselling services have historically been evaluated by observing the outcome of counselling calls (such as the frequency to which referrals are provided, or the pre-post change in behaviour or mental health). In addition, many telephone service satisfaction studies mistakenly measure perceived helpfulness (which may have more to do with the practicality of a service than satisfaction), and the two terms are often used interchangeably. As such, several authors have highlighted a need for more research regarding caller satisfaction. The lack of work in this area is in stark contrast to the growing body of literature regarding client satisfaction with telemedicine, and telepsychiatry.

In Chapter Three a review of telephone counselling literature was described and eight studies of a telephone helpline that included measures of satisfaction were identified, along with one further study regarding preferences for telephone counselling compared to face-to-face or video-conference counselling. Four of these studies were regarding substance use helplines and are described below. The remaining five studies were regarding: treatment for eating disorders, counselling for patients with breast cancer, a study of three Australian mental health services (Men’s Line, Care Ring and Lifeline), counselling for clients with a gambling
addiction, and an employee assistance helpline. Despite the differences in the treatment focus, each of these five studies reported high satisfaction with the services.

**Literature regarding satisfaction for substance use telephone counselling**

The literature on client satisfaction regarding telephone-based counselling services for substance use disorders provides a mixed picture. That is, two studies have reported on client satisfaction, while two studies referred to satisfaction but instead measured helpfulness and preference.

Amos et al. published the earliest investigation of caller satisfaction with a substance use helpline – a smoking helpline available to employees of British Telecom. From a sample of 696 respondents to a postal questionnaire, over two thirds were “very” or “quite satisfied” with the service, and 58% felt the helpline could assist them in reducing tobacco use. A second trial was conducted by Sabag-Cohen and colleague’s who recruited transplant patients (n=20) prior to surgery and assisted them in reducing substance use via telephone counselling. A small group (n=12) reported on their satisfaction with the telephone intervention and recorded high satisfaction (a minimum of four out of five on each scale item).

In contrast, a study regarding the helpfulness of 31 US substance use helplines did not depict consistent helpfulness. Two trained psychologists were recruited to make 346 scripted calls to the helplines and record whether they felt the service was “helpful” (sent self-help materials, or made a treatment referral), “neutral” (made a referral to another helpline), or “unhelpful” (gave incorrect information or were unable to answer the scripted question). This study found that helpfulness ratings were not uniform across different drugs of concern. More specifically, calls made regarding a scripted alcohol, cocaine or heroin use concern were more commonly recorded to be helpful (43, 40 and
40% were “helpful”) compared to tobacco or cannabis use concerns (28 and 25% were “helpful”).

A final study regarding substance use telephone counselling measured the preference ratings of 30 individuals with an alcohol use disorder for video-counselling, telephone counselling or face-to-face counselling. Participants were randomly allocated to receive two sessions based on motivational interviewing from one of the three delivery formats and then asked which format they would have preferred. This study reported that “participants expressed satisfaction with all three modes of communication, with no significant differences in preference”.

**CHAPTER AIMS**

It is the responsibility of every telephone counselling service to ensure that the unique nature of telephone counselling and any disadvantages inherent therein do not jeopardise the quality of the service, or the caller’s satisfaction with the service.

Despite this responsibility, the majority of telephone counselling services do not undergo any formal evaluation.

The present study was conducted to contribute to the very limited research regarding the satisfaction of an illicit drug helpline by conducting an impact evaluation of the CIH. This study had four aims: 1) profile the demographics, cannabis use, and treatment experiences of participants to supplement the information provided by the CIHLIFE database detailed in Chapter Four, 2) investigate the utility of the service by describing the content and outcomes of calls to the CIH, 3) determine the extent of caller satisfaction with the CIH service, and 4) identify which aspects of a telephone encounter predict increased satisfaction and use this information to inform on the development of a telephone-based cannabis intervention.
To address the methodological limitations of previous studies concerning client satisfaction and to achieve the third aim of the present study, multiple factors relating to satisfaction were measured: 1) caller satisfaction as measured by a validated scale, 2) perceived helpfulness of the service, 3) the working alliance and level of respect between caller and counsellor, 4) preference for the CIH service over alternative options, 5) the degree to which the CIH service was able to meet the needs of the caller, 6) how easy or difficult it was for callers to access a CIH counsellor, and 7) the call outcomes.

To achieve the fourth aim of the present study, aspects of the caller and the service provided were investigated to determine possible predictors of caller satisfaction. In the field of mental health and substance use counselling it has been recognised that individuals of younger age or lower quality of life, and services that do not provide a good patient-practitioner relationship, or are unhelpful, do not match to the needs of clients, or are difficult to access, are each associated with reports of low satisfaction. As such, each of these factors was hypothesised to be associated with low satisfaction in the present study.

**METHODS**

**Procedure**

Ethical approval for the study was gained from the University of New South Wales Human Research Ethics Committee in 2008. Participant recruitment commenced in February 2009 and was completed in December 2009. During the recruitment period, at the end of each call to the CIH, the counsellors asked any caller who identified being older than 16 years if they would be interested in participating in a survey regarding their satisfaction with the service. Any caller who provided verbal consent to participate
was asked to provide telephone contact information which was passed on to the candidate by secure email.

The candidate called each participant one week \((mean=7.87 \text{ days}, SD=1.57, median=7\) days, \(range=5-14\) days) after the participant’s initial conversation with the CIH to allow time for any requested printed information to be posted from the CIH and received by the participant. The interview took approximately ten minutes to complete and participants were not reimbursed for their participation. Attempts to contact participants (typically two or three attempts were sufficient) ceased when more than three calls per day had been made over three days, or more than 14 days had passed since the individual had first called the CIH. The period of contact was kept to within two weeks to enhance the probability that the participant would be able to fully recall their call to the CIH.

**Participants**

Of the 2,165 genuine calls (excluding hoax calls) answered by the CIH during the recruitment period: 353 callers (16.3%) were willing to leave their contact details; 236 callers (10.9%) were unwilling to leave their contact details; 197 callers (9.1%) were not informed of the survey; and no record was kept to report on whether the caller was informed about the survey or not for 1,379 calls (63.7%). Thus over half \((n=353; 59.9\%\) of callers who were reportedly informed of the survey agreed to participate.

Of the 236 callers who were recorded to be unwilling to leave contact information, the majority refused due to: disinterest (41.1%) or concern for maintaining anonymity (36.8%). Less common reasons for refusal included: previous participation in the study (8.9%), a lack of a personal telephone or mobile phone (2.5%), or a variety of less common other reasons (10.6%). Of the 197 callers who were recorded as not being
informed of the survey, the majority were not informed as the caller typically ended the conversation before the counsellor was able to mention the survey (94.4%). A small group of callers (5.6%) were not informed as the counsellor judged it to be inappropriate as the caller was too distressed during the call. Of the 353 callers who left contact details, just over half (56.7%) were not contactable within two weeks of their call to the CIH and were dropped from the study.

A total of 200 participants satisfied the study eligibility criteria of: being aged 16 years or older, making at least one telephone call to the CIH, providing consent and contact information to be contacted by an independent researcher, and being available for interview within two weeks of calling the CIH.

**The Impact Evaluation Survey**

The impact evaluation survey utilised in this study can be found in Appendix B. The questions included in the survey, and justification for their inclusion, are detailed here.

*Questions regarding caller demographic information*

Demographic data were collected using questions from the Australian National Minimum Data Set for Clients of Alcohol and Other Drug Treatment Services (NMDS-AODTS). This dataset was chosen to match the items collected by the CIH and to match all publicly funded drug or alcohol treatment agencies which are mandated to collect these data elements. In addition, as depicted in Table 5.1, four variables based on the Australian Bureau of Statistics indices of economic advantage or disadvantage informed the computation of a Socio-Economic Status (SES) scale (ranging from -4 to +4, representing extreme disadvantage to extreme advantage).
<table>
<thead>
<tr>
<th>Index of relative disadvantage</th>
<th>SES score</th>
<th>Index of relative advantage</th>
<th>SES score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not own a home</td>
<td>-1</td>
<td>Home ownership, or has a diploma qualification</td>
<td>+1</td>
</tr>
<tr>
<td>No educational qualification,</td>
<td>-1</td>
<td>Attended university, or has a diploma qualification</td>
<td>+1</td>
</tr>
<tr>
<td>or certificate qualification only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>-1</td>
<td>Employed</td>
<td>+1</td>
</tr>
<tr>
<td>Lives alone, or alone with children</td>
<td>-1</td>
<td>Lives with partner or family</td>
<td>+1</td>
</tr>
</tbody>
</table>

Note: those participants not scoring -1 or +1 receive a score of 0 for each of the four indices of relative advantage or disadvantage

**Questions regarding the participants’ cannabis use**

For those callers who used cannabis, three additional questions were selected to detail their cannabis use behaviours: 1) How often the caller used cannabis at the time of survey, 2) how many days the caller used cannabis in the 90 days prior to survey, and 3) how many cones or joints the caller would typically use in a day when they used cannabis. The question regarding how often the caller used cannabis was answered quantitatively as either: ‘recently abstinent’, ‘less than once a year’, ‘once a year’, ‘at least two or three times in the year’, ‘monthly’, ‘fortnightly’, ‘weekly’, or ‘daily’. This question was selected to categorise participants as relatively frequent (daily to fortnightly use) or infrequent (less than once a year to monthly use) cannabis users (thus, those who reported being recently abstinent were not included as cannabis users).

The selected quantity / frequency questions were an adaptation of the Form 90, and the quantity per day by number of days score has been identified to be one of the most common ways to measure substance use in treatment studies. To reduce complication during analysis of cannabis use, all cases where participants referred to the use of joints \((n=18)\) were converted to the use of cones via a published conversion rate of three cones to one joint.
Questions regarding the participants’ knowledge and expectations regarding the CIH service and alternative professional help

An individual’s knowledge and expectations regarding a service are directly related to their satisfaction with the service. As such, in the absence of a gold standard measure of expectations with substance use treatments, two simple questions were chosen to measure the participants’ knowledge and expectations of the CIH: 1) how many times the participant had rung the helpline previously, and 2) how the caller felt the CIH may be able to help them before calling. The question regarding how the caller felt the CIH could help was answered qualitatively. The participants also were asked if the caller knew of any alternative help-seeking options and what they were. This question was asked to reflect the participants’ knowledge of available cannabis treatments.

Questions regarding the ease to which the participant accessed the CIH service

As there is no standard measure of treatment accessibility, four questions were used to determine the ease of which the caller was able to reach a CIH counsellor: 1) if the caller was able to access the CIH on their first attempt to call, 2) if the call was made successfully during office hours, or if the caller was asked to leave a message, 3) how long it took for the caller to access the CIH from their initial attempt to their successful contact (hereby referred to as ‘access time’, coded ‘0’ for any response that took more than one week, ‘1’ for approximately one week, ‘2’ for closer to two to four days ‘3’ for one day, ‘4’ for the same day several hours later, ‘5’ for a matter of an hour or two, and ‘6’ for no wait at all), and 4) a rating on an 11 point Likert scale depicting how easy it was for the caller to get through to a counsellor (hereby referred to as ‘ease of access’; from ‘0’ to ‘10’, where ‘0’ indicated “not at all easy”, and ‘10’ indicated “very easy”).
Questions regarding the participants’ satisfaction with, perceived helpfulness of, and preference for, the CIH

Data regarding satisfaction with the service were collected using the eight item Client Satisfaction Questionnaire (CSQ-8). This measure was selected as it has been used in published evaluation papers for telepsychiatry services, and mental health services, and has been validated cross-nationally (internal consistency coefficient $\alpha \approx 0.93$). For this study the scale showed good internal consistency ($\alpha=0.9$). In addition, participants were asked to rate their overall general satisfaction with the call on an 11 point Likert scale (where ‘0’ indicated “not at all satisfied”, and ‘10’ indicated “completely satisfied”). This question was included as a secondary indicator of caller satisfaction with the service as it was thought to be more appropriate for individuals who did not access the CIH service with a cannabis-related problem (such as callers requesting information) and is also a common method of satisfaction measurement in healthcare literature.

The needs of the participant also are directly related to satisfaction ratings. As such, participants were asked if they had any unmet needs, and if so, the participants were asked to describe their unmet need. In addition, the participants were asked an open-ended question on how the CIH service could improve upon their current operations.

Perceived helpfulness and/or the impact of a service is often utilised in evaluation studies as proximate measures of satisfaction or perceived effectiveness. As such, the present study included a series of questions to indicate how helpful the callers found the service. First, participants were questioned as to the reason for their call. Next, the participants rated on an 11 point Likert scale the perceived helpfulness of
the call (where ‘0’ indicated “not helpful at all”, and ‘10’ indicated “very helpful”) and the impact that the call had (were ‘0’ indicated “no impact”, and ‘10’ indicated “large impact”) for each identified reason for calling.

In addition, two questions were included to determine if the participant had a preference for calling the CIH service over alternative forms of help: 1) participants who had identified any alternative forms of help were asked if they had a preference for the CIH service, and if so, why; and 2) participants were asked to rate the likelihood that they would call the CIH again on an 11 point Likert scale as opposed to seeking alternative help (where ‘0’ indicated “definitely will not call again”, and ‘10’ indicated “definitely will call again”).

Questions regarding the working alliance between the participant and CIH counsellor

The interpersonal relationship between the participant and counsellor, or working alliance, is thought to be integral to evaluations of face-to-face counselling services, but has received relatively little attention in regards to telephone counselling services.\textsuperscript{72,73} To address this gap, the working alliance between the participant and the CIH counsellor was assessed using an empathy scale consisting of ten questions,\textsuperscript{773} and a custom measure of interpersonal respect. The empathy scale was included to measure the interpersonal relationship between the participant and counsellor for three reasons: 1) it has been validated with adequate internal consistency ($\alpha=0.7$),\textsuperscript{774} 2) there is currently no standard measure capable of representing all of the specifics to the relationship formed,\textsuperscript{728} and 3) interview brevity was preferred as participants were not reimbursed for their time and this scale was not as lengthy as more common measures including the Working Alliance Inventory.\textsuperscript{741} The empathy score ranged from −15 to
+15, indicating a poor to strong working alliance. In this study the scale also showed adequate internal consistency ($\alpha=0.7$).

Participants also were asked to rate the degree of respect that the counsellor showed toward them during the call on an 11 point Likert scale (where ‘0’ indicated “no respect at all”, and ‘10’ indicated “complete respect”). This question was included as a client’s perception of respect, along with empathy and warmth, has been identified to contribute to the alliance construct,\textsuperscript{775,776} and was not included in the chosen empathy scale.

*Questions relating to the call outcomes*

Participants were asked which of four call outcomes they experienced: 1) if they made a plan of action with the counsellor and, if so, how confident they were in carrying out that plan (rated on an 11 point Likert scale where ‘0’ indicated “not at all confident”, and ‘10’ indicated “completely confident”), 2) if they were offered a referral and, if so, the likelihood that they would contact the health professional (rated on an 11 point Likert scale where ‘0’ indicated “no chance”, and ‘10’ indicated “definitely”), 3) if they were offered any printed information during their call to the CIH, and if so, if the information had arrived, if they had read it, and how helpful they found it (where ‘0’ indicated “not helpful at all”, and ‘10’ indicated “very helpful”); and 4) if they were referred to the NCPIC website to gain information relating to cannabis use and, if so, if they had accessed the website or not. The number of call outcomes experienced was summed to compute a variable (from 0 to 4) used to represent the practicality of the call.

*The Cannabis Information and Helpline dataset (CIH LIFE)*

During the period of the evaluation the CIH routinely collected information regarding each answered call in a database named CIH LIFE (see Chapter Four pp.165-167 for
further detail). The callers’ ID number was used to merge the CIH LIFE dataset with the survey dataset from this study. The variables from the CIH LIFE dataset that were of interest to this study were the callers’ post code and the counsellors’ record regarding which of eleven different counselling components were utilized during the call (such as reflective listening, cognitive reframing, etc; see Chapter Four, pp. 182-183 for further detail), and the call duration.

**Data Analysis Techniques**

The quantitative and qualitative data in this study were analyzed using PASW Statistics 18, Release Version 18.0.0 (SPSS, Inc., 2009, Chicago, IL, [www.spss.com](http://www.spss.com)). Qualitative data were coded and organized into categories using the open coding techniques from grounded theory whereby similar responses were grouped according to identified themes. To address the first three aims of this study (to profile the callers to the CIH service and to describe the call outcomes and caller satisfaction with the service), a frequency and descriptive analysis was conducted. The aspects described to illustrate caller satisfaction included: overall caller satisfaction, working alliance between the caller and counsellor, caller preference for the CIH over alternative help, ease of access to the service, perceived helpfulness, and if the service was able to meet the caller's needs. Between-group comparisons among caller types and caller gender were conducted by independent t-tests and chi-square analysis. Non-parametric testing (independent-samples Mann-Whitney U Test) was utilised for non-normal data.

A linear regression analysis was conducted to address the final aim of determining the statistically significant predictors of caller satisfaction. Visual analysis of box plots revealed several univariate outliers and observation of Mahalanobis Measure distances revealed two multivariate outliers. As there was no cause to believe that these cases did
not reflect real observations, and because their removal did not change the significance of the regression, the full dataset was used.

RESULTS

Aim one: Profile the callers to the CIH

Participant profile – Caller type

Two types of callers with different demographic profiles and reasons for calling were identified in this evaluation survey. That is, callers who identified as a cannabis user (n=88; 44%) (hereby referred to as the ‘cannabis-user group’), or who did not identify themselves to be a cannabis user (n=112; 56%) (hereby referred to as the ‘non-user group’).

Participant profile – Caller demographics

The majority (n=181; 90.5%) of participants had shared their postcode with the CIH counsellors at the time of their call. Most Australian states were represented in the survey sample (New South Wales=40.3%, Victoria=27.1%, Queensland=19.9%, South Australia=7.2%, Western Australia=5.0%, Tasmania=0.6%). Demographic information is presented in Table 5.2, detailed by caller type.
Table 5.2 Demographic details of participants, detailed by caller type

<table>
<thead>
<tr>
<th>Demographic detail</th>
<th>Cannabis-user group (n=88) %</th>
<th>Non-user group (n=112) %</th>
<th>Total (n=200) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42.0</td>
<td>71.4</td>
<td>58.5</td>
</tr>
<tr>
<td>Male</td>
<td>58.0</td>
<td>28.6</td>
<td>41.5</td>
</tr>
<tr>
<td>Living Arrangement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>21.6</td>
<td>13.4</td>
<td>17.0</td>
</tr>
<tr>
<td>Alone with kids</td>
<td>8.0</td>
<td>6.3</td>
<td>7.0</td>
</tr>
<tr>
<td>With partner</td>
<td>15.9</td>
<td>29.5</td>
<td>23.5</td>
</tr>
<tr>
<td>With partner and kids</td>
<td>22.7</td>
<td>40.2</td>
<td>32.5</td>
</tr>
<tr>
<td>Other family</td>
<td>15.9</td>
<td>4.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Friends</td>
<td>11.4</td>
<td>3.6</td>
<td>7.0</td>
</tr>
<tr>
<td>Other</td>
<td>4.5</td>
<td>2.7</td>
<td>3.5</td>
</tr>
<tr>
<td>ATSI status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Indigenous</td>
<td>94.3</td>
<td>100</td>
<td>97.5</td>
</tr>
<tr>
<td>Aboriginal/ Torres Strait Islander</td>
<td>5.7</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>55.7</td>
<td>65.2</td>
<td>61.0</td>
</tr>
<tr>
<td>Not in the workforce</td>
<td>44.3</td>
<td>34.8</td>
<td>39.0</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than year 12</td>
<td>38.6</td>
<td>29.5</td>
<td>33.5</td>
</tr>
<tr>
<td>Year 12</td>
<td>18.2</td>
<td>11.6</td>
<td>14.5</td>
</tr>
<tr>
<td>Beyond year 12</td>
<td>43.2</td>
<td>58.9</td>
<td>52.0</td>
</tr>
</tbody>
</table>

Chi-square analysis was conducted to determine if there was a statistically significant difference between caller type and gender. Compared to the cannabis-user group, the non-user group was just over three times more likely to be female ($\chi^2=17.53$, $p<0.001$, $OR=3.45[1.91-6.21]$). In addition, the non-user group were of a significantly greater socio-economic advantage compared to the cannabis-user group ($t=3.94$, $p<0.001$). That is, the non-user group reported a mean SES score of 1.68 ($SD=2.02$) compared to the cannabis-user group with a mean of 0.47 ($SD=2.32$).

The age of callers is depicted in Table 5.3, detailed by caller type. The non-user group were found to be significantly older than cannabis-user group ($t=7.45$, $p<0.001$).

Table 5.3 Caller age depicted by caller type

<table>
<thead>
<tr>
<th>Age, in years</th>
<th>Cannabis-user group (n=88)</th>
<th>Non-user group (n=112)</th>
<th>Total (n=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>35.66 (8.38)</td>
<td>47.72 (12.65)</td>
<td>42.45</td>
</tr>
<tr>
<td>Median</td>
<td>35</td>
<td>47</td>
<td>41</td>
</tr>
<tr>
<td>Range</td>
<td>15-60</td>
<td>21-80</td>
<td>15-80</td>
</tr>
</tbody>
</table>
**Participant profile – Frequency of cannabis use**

The cannabis-user group ($n=88$) reported their use at the time of interview to be: daily (52.3%), weekly (10.2%), or less often than weekly (3.3%). In addition, approximately one third (34.1%) reported being abstinent at the time of interview. In the 90 days previous to interview, the participants were using cannabis on an average of 73.71 days ($SD=22.19$, $median=83$ days). On a typical day, the participants identified using an average of 17.60 cones ($SD=14.60$, $median=15$). The combination of this data showed that these participants used an average of 1253.84 cones ($SD=1250.21$, $median=930$ cones) in the 90 days previous to interview. Non-parametric testing was used as frequency of use was not normally distributed, and no significant difference between caller gender and cannabis use frequency was found ($p=0.402$).

**Participant profile – Knowledge of the CIH and alternative forms of help**

The majority (90.5%) of participants had not called the CIH prior to the occasion on which they were recruited into the study. The sample who had called at least once before ($n=19$), had made an average of two calls ($SD=1.74$, $median=1$, range=1-6) before they were interviewed. Participants first heard of the CIH telephone number through: an online search (31%), advertisement on the radio (22.5%), searching the yellow pages telephone directory (20.0%), referral from a health professional (18.5%), a brochure (7.0%), or other means (1.0%).

Approximately half of participants ($n=105$; 52.5%) were aware of alternative forms of professional help regarding their cannabis use concern at the time of their call to the CIH. These forms of help were identified to be: another helpline such as *Lifeline* or *ADIS* (27.2%), face to face counselling (24.3%), a general practitioner (22.3%), web-based help (19.4%), specialist drug treatments (16.5%), professional colleagues or
family (9.7%), information from brochures (2.9%), and other forms of help (2.9%). Chi-square analysis failed to show a statistically significant difference between the caller types and knowledge of alternative forms of help (p=0.2).

**Participant profile – Previous cannabis use treatment history**

Around two-thirds (66.5%) of participants had ever consulted with at least one health professional regarding cannabis use concerns before calling the helpline. This subsample (n=133) reported visiting a: general practitioner (40.2%), counsellor/psychologist (23.7%), telephone counsellor (19.1%), drug treatment service (10.3%), alternative health / medicine worker (7.7%), mental health service (6.2%), hospital worker (3.1%), and/or social worker (3.1%). Chi-square analysis showed that the non-user group was twice as likely to have consulted with a health professional compared to the cannabis-user group ($\chi^2=5.03$, $p=0.02$, $OR=2.01[1.09-3.70]$).

**Participant profile – Expectations of the CIH service**

As detailed in Table 5.4, prior to contacting the CIH, the two caller types each had various expectations as to how the CIH service would be able to help them with their cannabis-related concern. This analysis revealed that the non-user group was statistically significantly more likely to expect the CIH service to provide printed information and advice or strategies, while the cannabis-user group were statistically significantly more likely to expect someone to talk to. Finally, the cannabis-user group tended to be more likely to expect counselling than the non-user group, although this difference was not found to be statistically significant.
Table 5.4 Participant’s expectations regarding the CIH service and between-group analysis

<table>
<thead>
<tr>
<th>Expected help</th>
<th>Cannabis-user group ((n=88)) %</th>
<th>Non-user group ((n=112)) %</th>
<th>Total ((n=200)) %</th>
<th>(\chi^2) statistic</th>
<th>p-value</th>
<th>Odds Ratio ((95% \text{ CI}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counselling</td>
<td>59.1</td>
<td>48.2</td>
<td>53.0</td>
<td>2.34</td>
<td>0.126</td>
<td>1.55 ((0.88-2.73))</td>
</tr>
<tr>
<td>Printed info</td>
<td>9.1</td>
<td>33.9</td>
<td>23.0</td>
<td>17.17</td>
<td>&lt;0.001</td>
<td>0.20 ((0.09-0.45))</td>
</tr>
<tr>
<td>Advice</td>
<td>21.6</td>
<td>36.6</td>
<td>30.0</td>
<td>5.29</td>
<td>0.021</td>
<td>0.48 ((0.25-0.90))</td>
</tr>
<tr>
<td>Someone to talk to</td>
<td>28.4</td>
<td>15.2</td>
<td>21.0</td>
<td>5.20</td>
<td>0.023</td>
<td>2.22 ((1.11-4.44))</td>
</tr>
<tr>
<td>No expectation</td>
<td>11.4</td>
<td>6.2</td>
<td>8.5</td>
<td>1.66</td>
<td>0.198</td>
<td>1.92 ((0.70-2.28))</td>
</tr>
<tr>
<td>Strategies</td>
<td>9.1</td>
<td>19.6</td>
<td>15.0</td>
<td>4.30</td>
<td>0.038</td>
<td>0.41 ((0.17-0.97))</td>
</tr>
<tr>
<td>Referral</td>
<td>6.8</td>
<td>9.8</td>
<td>8.5</td>
<td>0.57</td>
<td>0.450</td>
<td>0.67 ((0.24-1.89))</td>
</tr>
<tr>
<td>Other</td>
<td>3.4</td>
<td>5.4</td>
<td>4.5</td>
<td>0.44</td>
<td>0.509</td>
<td>0.62 ((0.15-2.57))</td>
</tr>
</tbody>
</table>

Note: Figures highlighted in bold represent the comparison group found to be significantly more likely to report this form of expected help

Aim two: Describe the content and outcomes of calls to the CIH service

Call content and duration

The CIHLIFE database was accessed to determine the call duration and number of counselling components utilised by the counsellors during the participant’s call to the CIH. As call duration was not normally distributed, non-parametric testing was used and showed a significant difference between caller types and the call duration \((p=0.038)\). The cannabis-user group spoke with counsellors for an average of 30.72 minutes \((SD=20.36)\) compared to an average of 24.62 minutes \((SD=16.22)\) for the non-user group. No significant difference \((p=0.093)\) was found between caller types and the number of counselling components reported, and an average of 7.05 \((SD=2.17)\) out of 11 possible components were utilised per call. The components most frequently reported were: reflective listening \((90.9\%)\), open ended questioning \((95.2\%)\), exploring, paraphrasing and summarising the caller’s situation \((83.3\%, 46.5\% \text{ and } 79.0\%)\), respectively, and cognitive reframing \((55.9\%)\).
Call outcomes – plan of action

Fewer than half (39.5%) of participants made a ‘plan of action’ with the counsellor during the call. Chi-square analysis showed that the cannabis-user group were statistically significantly more likely to report making a plan of action ($\chi^2=4.25$, $p=0.039$, $OR=1.83[1.03-3.25]$; 47.7% compared to 33.3%, respectively). Those participants ($n=79$) who made a plan of action rated their confidence in carrying out that plan at a mean rating of 7.74 ($SD=2.47$, $median=8.0$) out of 10. Participants indicated that the counsellor exhibited a small degree of direction in developing the plan, giving a mean rating of 6.85 ($SD=3.0$, $median=7.0$) out of 10 (where ‘5’ indicated a mutual decision). The participants’ confidence in carrying out the plan, and the degree of counsellor direction were not normally distributed. Non-parametric testing failed to show a significant difference between caller types and ratings on these scales ($p=0.713$ and $p=0.221$, respectively).

Call outcomes – referrals

Fewer than half of the participants (41.5%) were offered a referral to alternative cannabis treatments during the call, and no significant difference in this proportion between caller types was found ($p=0.065$). For those offered a referral ($n=83$), most (56.6%) had not made contact in the week after their call. Moreover, these participants indicated that they would typically not make contact, rating the overall likelihood at an average of 4.32 ($SD=3.96$, $median=5.0$) out of 10. As this rating was not normally distributed non-parametric testing was used and found no difference between the two caller types regarding the likelihood of making contact ($p=0.272$)
**Call outcomes – self-help materials**

Fewer than half of participants (43.0%) asked to receive printed materials during the call. Chi-square analysis showed that the non-user group was significantly ($\chi^2=12.02$, $p=0.001$, $OR=0.36[0.20-0.64]$) more likely than the cannabis-user group to ask to receive printed materials (54.1% compared to 29.5%). From the subsample of participants who ordered the materials ($n=86$), two thirds (66.0%) had received the materials, although less than half (45.9%) had a chance to read them before interview. Those who had read the information by the time of interview ($n=33$) indicated that the materials were helpful, rating them at an average of 8.03 ($SD=1.91$, $median=8.0$, $range=5-10$) out of 10. As this rating was not normally distributed, non-parametric testing was used and found no statistically significant difference between caller types regarding the material helpfulness ratings.

Over two thirds (69.3%) of participants were referred to the NCPIC website during their call to the CIH with no statistically significant difference in the proportion of those receiving a referral in cannabis-user and non-user groups ($p=0.79$). Over half (58.9%) of those participants linked to the website reported that they had accessed the website and a small group (27%) reported that while they had not yet accessed the website, they intended to do so.

A practicality score was created, reflecting the addition of whether or not the participants had made a plan of action, received a referral, asked for printed materials, or were shown the NCPIC website. The participants reported an average score of 2.2 ($SD=1.03$) out of 4, and non-parametric testing failed to show a statistically significant difference between the practicality ratings by the two caller types ($p=0.255$).
Aim three: Describe the caller’s satisfaction with the CIH service

A number of measures were used to address the participants’ satisfaction with the CIH: the ease of access to the service, the overall satisfaction with the service, the perceived helpfulness of the service, preference for the CIH service over alternative professional help, and the strength of the working alliance formed during the call.

Ease of access

Most participants were able to get through to a counsellor when they first called (80%). Those participants who were unable to get through on their first attempt (n=40), were typically unable to get through because they called outside of office hours (65%). Those unable to get through left a voice-mail message (55%), or decided to call back later (45%).

Although the majority of callers did not have to wait (78%) to get through to a counsellor, one in five waited several hours (20.0%), or between one or two days (2.0%) before making a successful second attempt. Participants rated the ease of access as an average score of 9.21 ($SD=1.50$, $median=10$) out of 10. Two participants reported the lowest overall access score and the majority of participants (65%) reported the highest score. As this variable was not normally distributed, non-parametric testing was used and no significant difference between caller type and the ease to which the service was accessed was found ($p=0.904$).

Overall satisfaction with the CIH

Participants reported an average Client Satisfaction Questionnaire (CSQ) score of 28.19 ($SD=4.34$, $median=29$, $range=11-32$) out of a possible 32. No participant rated the CIH
with the lowest satisfaction score, while approximately one in five (22%) rated the CIH with the highest satisfaction score.

Participants also rated their global satisfaction with the CIH on an 11-point Likert scale and reported an average score of 8.62 (SD=1.84, median=9) out of 10. Two participants rated the CIH with the lowest score, while a little fewer than half (41%) rated the CIH with the highest score. No significant differences between the caller types were noted regarding the reported CSQ scores (p=0.195) or the overall global satisfaction (p=0.504).

Reports of an unmet need or suggestion for service improvement

The majority (82%) of participants did not report any unmet needs and no significant difference in the proportion of those who described having their needs met was noted between the two caller types (p=0.758). Of those reporting at least one unmet need (n=36), the specific complaints were coded into categories including: the information provided was not helpful enough (n=13, 36.1%), the service could not provide a “quick fix” solution or prescribe medicine (n=6, 16.7%), an adequate treatment referral was not given (n=6, 16.7%), the service could not provide ongoing support (n=6, 16.7%), the service did not use an appropriate counselling style (n=4, 11.2%), or the counsellors could not attend to a non-cannabis drug problem (n=1, 2.8%).

Just under half (45%) of participants had a suggestion for the improvement of the service and no significant difference in the proportion making a suggestion was noted between the two caller types (p=0.188). Of those reporting a means for improvement (n=90), the improvements were coded into categories including: extending the opening hours or offering call back services (20%), improving information regarding referrals (17.8%), improving the CIH tab on the NCPIC website (13.3%), improving the
information or advice on topics such as urine testing (13.3%), improving the style or amount of counselling provided (12.2%), including an ability to help another individual more directly by contacting the individual of concern (8.9%), allowing the counsellors to discuss their own drug use history (4.4%), and several less common other suggestions (9.9%).

As the variables indicating the presence of an unmet need and a suggestion for improvement were highly correlated ($r=0.391$, $p<0.001$) a score was computed to represent the overall extent to which participants had any unmet needs, ranging from 0 (all needs met) to 2 (representing participants with an unmet need and a suggestion for service improvement). Participants reported an average score of 0.63 ($SD=0.71$, $median=0$). As this variable was not normally distributed, non-parametric testing was used and no significant difference between caller type and the extent to which the participant’s needs were met was shown ($p=0.450$).

*Perceived helpfulness of the CIH*

As detailed in Table 5.5, participants rated the helpfulness and perceived impact of the call from 0-10 regarding each of seven different ways in which the call was identified to be helpful. No significant difference between caller types and the reported helpfulness or impact scores was found (all $p>0.3$).
### Table 5.5 Participant ratings of CIH call helpfulness and impact

<table>
<thead>
<tr>
<th>How did the CIH help?</th>
<th>Number of calls*</th>
<th>Helpfulness rating Mean (SD)</th>
<th>Impact rating Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To reducing cannabis use</td>
<td>27</td>
<td>7.15 (2.51)</td>
<td>5.74 (2.55)</td>
</tr>
<tr>
<td>To quit cannabis use completely</td>
<td>23</td>
<td>7.87 (2.53)</td>
<td>7.48 (2.56)</td>
</tr>
<tr>
<td>To address problems with family relationships</td>
<td>27</td>
<td>8.96 (2.01)</td>
<td>7.7 (2.58)</td>
</tr>
<tr>
<td>Offer general support</td>
<td>51</td>
<td>8.88 (1.61)</td>
<td>7.84 (2.34)</td>
</tr>
<tr>
<td>Provide needed information</td>
<td>86</td>
<td>8.17 (2.51)</td>
<td>6.97 (3.44)</td>
</tr>
<tr>
<td>Other forms of help</td>
<td>17</td>
<td>7.80 (3.18)</td>
<td>6.29 (3.57)</td>
</tr>
<tr>
<td>Helping to address a friend/family member’s cannabis use concerns</td>
<td>79</td>
<td>7.35 (3.06)</td>
<td>#</td>
</tr>
<tr>
<td><strong>Total (combined average)</strong></td>
<td>310</td>
<td>8.14 (2.39)</td>
<td>7.02 (3.02)</td>
</tr>
</tbody>
</table>

* Participants could select more than one way in which their call was helpful to them

# Participants were not asked to rate their confidence that their friend or family member would address their own cannabis use

**Perceived preference for the CIH compared to other professional help**

Of those participants who were aware of alternative forms of help (n=105), three quarters (74.3%) indicated that they preferred to contact the CIH. In addition, participants rated the likelihood that they would consider calling back the helpline in the future if they were faced with another cannabis-related concern as an average score of 7.94 (SD=2.86, median=10, range=0-10) out of 10. Approximately half (49.0%) of participants reported the highest score, while ten participants (5%) reported the lowest score. As this variable was not normally distributed, non-parametric testing was used and no significant difference between caller type and ratings of preference was found (p=0.620).

**Perceived level of counsellor empathy and respect (working alliance)**

The average empathy rating was 12.71 (SD=3.10, median=14, range=-4-15). One participant (0.5%) reported the lowest score and over one third (40%) reported the highest score. Participants also rated how much respect they perceived the counsellor showed them during the call as 9.41 out of 10 (SD=1.21, median=10). One participant
(0.5%) reported the lowest respect score, and two thirds (68%) reported the highest respect score. No significant difference was noted between the two caller types and the ratings of empathy \((p=0.324)\) or respect \((p=0.192)\). Taken together these scale scores indicate that the majority of participants reported forming a strong working alliance with the counsellors.

**Aim four: identify predictors of call satisfaction**

A linear regression analysis was conducted with seven predictor variables regarding the service and five predictor variables regarding the participant. As the two satisfaction scale scores (CSQ-8 and the overall satisfaction 11-point Likert scale) were significantly correlated \((r=0.81; t<0.001)\), a total satisfaction score was created for this regression utilising the average of their standardised scores \((Z\text{-scores})\). Variables regarding the service included: 1) the ease of access; 2) the empathy scale score; 3) the combined total helpfulness score; 4) the indicator of overall unmet need; 5) the call duration; 6) the number of counselling components used during the call; and 7) the indicator of the practicality of the call. Variables regarding the caller included: 1) age; 2) gender; 3) SES score; 4) caller type, and 5) knowledge of alternative treatments (a dummy variable was created to represent knowledge or ignorance of treatments).

The final regression model \((R^2=0.74, F_{12,155}=15.46)\) found that the empathy score \((\beta=0.12, t=6.19, p<0.001)\), the overall helpfulness of the call \((\beta=0.30, t=4.72, p<0.001)\), and whether the caller identified an unmet need \((\beta=-0.29, t=-3.91, p<0.001)\) were statistically significant predictors of satisfaction with the call.
DISCUSSION

Overall, callers to the CIH were highly satisfied with the service, with no statistically significant difference between callers who reported using cannabis and those concerned about another individual’s use. The empathy expressed by the counsellor, the helpfulness of the call, and whether or not the caller’s needs were met were each statistically significantly associated with caller satisfaction.

The first aim of this study was to profile the demographic and cannabis use characteristics of CIH callers. In particular, detail regarding the participants’ frequency of cannabis use and experience with cannabis treatment, and expectations of the CIH service was provided to a greater extent than was routinely collected by the CIH. Past 90 day cannabis use was described by almost half of the sample (44%) and these participants reported frequent and heavy use (an average of 74 days smoking 18 cones per day). The majority (91%) of participants called the CIH for the first time prior to being recruited into the study survey indicating that repeat callers were not frequent. The participants, however, commonly reported a lifetime consultation with at least one other health professional regarding their cannabis use before calling the CIH (67%) and most frequently reported consulting with a general practitioner (40%). Approximately half (53%) of participants were aware of an alternative form of professional help at the time of their call and the three most commonly cited forms of help were another helpline (27%; typically Lifeline or ADIS), web-based help (19%), and general practitioners (22%). Finally, the participants reported expecting that the CIH service would provide counselling services (53%), general advice (30%) and links to printed information (23% of the total sample but 34% of non-cannabis using callers), while expecting to receive a referral to alternative treatment was not common (9%).
The second aim of this study was to describe the outcomes of calls to the CIH. The most commonly reported call outcome was to be linked to the National Cannabis Prevention and Information Centre’s website (69% of participants). Moreover, almost all of the participants given the link had either investigated the website within the week following their call, or intended to at the time of survey (86%). Notably, fewer than half (40%) of participants reported making a plan of action during the call, however, those participants who had made a plan of action reported being confident in carrying out the plan (an average of 8 out of 10). Consistent with the infrequent expectation that the CIH would provide referrals to alternative treatment, fewer than half (42%) of participants reported receiving a referral. It was uncommon for these participants to have made contact with the referred agency within the week following their call to the CIH and the participants did not indicate an intention to make contact (the likelihood was rated as an average of 4 out of 10). Finally, fewer than half of participants (43%) asked to receive printed materials during their call to the CIH (non-cannabis using participants reported this outcome more frequently compared to cannabis users; 54% compared to 30%). From this subsample, the majority (66%) had received the materials in the week following their call and those who had read the information (46% of the subsample) rated the materials very highly (an average of 8 out of 10).

The third aim was to describe the satisfaction of CIH callers with the service. CIH callers rated their satisfaction with the service as a median score of 28 out of a possible 32 on the CSQ-8, and one in five participants reported the maximum score of 32. In order to assess a greater breadth of the participants’ satisfaction with the CIH service, this study also included measure of: how easy the service was to access; the perceived helpfulness of the call; the preference to use the service over alternative help; and the presence or absence of unmet needs. In each respect the participants rated the CIH
service very positively. That is, the service was illustrated to be easy to access (an average rating of 9 out of 10), helpful (an average rating of 8 out of 10), and few participants reported an unmet need (18%). Further, three-quarters of participants preferred the CIH over alternative help. In fact, the likelihood of calling back the CIH service (typically rated as 8 out of 10, where ‘10’ was “definitely will”) was rated higher than the likelihood of following through with any referrals that were given during the call (typically rated as 4 out of 10). This suggests that, service delivery over the phone may be necessary for some people. However, these results are unsurprising given that callers chose a helpline as their source of assistance.

The high satisfaction scores are consistent with two previous studies of satisfaction with substance use helplines, in which a minimum of two thirds of callers reported high satisfaction. In contrast, the observed satisfaction was not consistent with a study regarding the perceived helpfulness of US drug helplines. Hughes et al. studied the ratings of perceived helpfulness given by trained psychologists who pretended to be a concerned caller to 31 national drug helplines. The perceived helpfulness of services which were called by psychologists mimicking a cannabis-related concern was low (25% of these calls were rated to be “helpful”). In this study, however, ‘helpfulness’ was limited to whether or not the helpline sent self-help materials, or made a treatment referral and did not otherwise reflect the quality of the service or the counselling that may have been provided.

The fourth aim of this study was to determine predictors of satisfaction with the CIH service and to determine the appropriateness of approaching the CIH to deliver a cannabis intervention. It was hypothesised that participants of younger age and lower SES who expressed a poor working alliance with the counsellor, low call helpfulness,
unmet needs, and difficulty accessing the service would express low call satisfaction. Results showed partial support for this hypothesis in that, aspects of the call, (including counsellor empathy, helpfulness and attention to needs), and not aspects of the caller (including age, gender, SES or whether the caller reported using cannabis or was calling about another’s cannabis use), significantly predicted levels of satisfaction with the telephone service. Calls which involved CIH counsellors that were empathic and warm toward the caller, who ensured that the caller had no unmet needs, and found the call helpful before completing a call were rated with particularly high satisfaction.

These factors that significantly predicted satisfaction are supported by a body of literature that highlights the importance of working alliance, and meeting treatment needs. In particular, the importance of ensuring the caller has no unmet needs has been supported by the Substance Abuse and Mental Health Services Administration in the 1997 National Treatment Improvement Evaluation Study (NTIES). That is, the 1997 NTIES described clients’ ratings of substance use treatment helpfulness to marginally increase as the number of unmet needs decreased. Also, research regarding the matching of client treatment needs to services provided has shown a positive association between better matching and greater satisfaction. Finally, the statistically significant predictor of satisfaction, call helpfulness, was unsurprising given that this construct is commonly used to measure caller satisfaction in previous research.

Alternatively, the results also highlighted that the availability, call duration, counsellor content, and demographic profile of the caller were not associated with satisfaction. These results are inconsistent with research that has identified the importance of treatment accessibility and the importance of an individual’s age and gender in
predicting satisfaction with face-to-face substance use treatment,\(^{701,736-738}\) and in primary care.\(^{719}\) Further, an association between client satisfaction and the utilisation of, and retention in, appropriate treatment services has been demonstrated.\(^{701,711}\) In the present study, service utilisation and retention were not directly measured, although the accessibility of the CIH, the call duration and the counselling content to each call was measured and may indirectly relate to service utilisation. Thus, it was surprising that these indirect measures did not demonstrate any statistically significant association with client satisfaction.

As part of the fourth aim of this study, it was of interest to determine if the predictors of satisfaction with the CIH service might inform the development of a telephone-based cannabis use intervention. In particular, the lack of association between the call duration and content is of interest in the development of a telephone-based cannabis intervention. That is, as high satisfaction was reported even with very brief telephone calls, it could be that a telephone service is expected to be brief. Thus, a brief proactive treatment model may be well suited to the telephone – a model found to be effective in treating cannabis use and related concerns with the benefit of avoiding the unnecessary financial burden inherent in more intensive treatments.\(^{299,329}\) Further, the results of the present study, and a significant body of similar research regarding face-to-face treatments,\(^{727,739-741}\) suggests that the satisfaction of participants regarding the proactive service would improve if the service is developed in such a way that allows time to establish a strong working alliance before beginning with the treatment proper in each counselling session.
Future work

Further work is required to identify a reason for the finding that aspects of the caller did not predict satisfaction. Perhaps there are common elements underlying older age or gender (such as increased responsibilities, or greater need for child care services) that may impact on client satisfaction with face-to-face services that are overcome by the increased accessibility and anonymity offered by the telephone. The lack of association between caller demographics and caller satisfaction and the typical reporting of high satisfaction are of interest to the development of a telephone-based cannabis intervention. It could be that the telephone service is more applicable to individuals throughout Australia of any demographic than face-to-face services (which may demonstrate greater applicability for younger treatment seekers).\textsuperscript{701} The finding that the ease of access or call duration were not statistically significantly associated with satisfaction also requires further work to explain. Two unexplored explanations are that the concerns of callers were largely attended to in a short amount of time, or that callers were not disheartened when confronted with a need to call the service back given the ease of doing so.

Limitations

The present study was not without limitations. Firstly, the sample of 200 callers was a small proportion of the 2165 genuine calls received by the CIH during the evaluation period and, as is common in any evaluation of satisfaction, there may have been bias in the sample of participants who were interviewed.\textsuperscript{719} That is, it is conceivable that those who were unsatisfied with the CIH, or called regarding a less severe cannabis-related concern, or had less spare time, may have been less willing to participate in the study and thus not interviewed. The sample size, however, was assumed to be sufficient to
power the regression analysis utilised. That is, although a power analysis was not possible in the absence of a projected effect size, a ‘rule of thumb’ suggests that 15 participants for each regression variable included in the model are required as a minimum.\textsuperscript{779, p.63} As such, in this study, a minimum of 180 participants was required.

Second, the telephone interview was conducted just over one week after the participant’s call to the CIH to allow for printed information to be received by post and may have resulted in a loss of some validity due to a participant’s inability to accurately recall the details of their call.

\textbf{Implications and conclusions}

This study provides the first evaluation of caller satisfaction with an illicit drug helpline. Satisfaction with a single phone call lasting less than thirty minutes was expressed by the majority of callers, regardless of whether or not the caller used cannabis – two groups with obvious differences in their reasons for calling. These results suggest that it is possible to accurately attend to the needs of callers with a wide spread in age, gender, socio-economic status, and reason for calling in a satisfying manner, even when contact lasts an average of less than half an hour. Further, to achieve the most satisfying results, the counsellor’s main focus during a call should be creating an accurate working alliance while meeting the expressed needs of the caller in an attempt to improve overall helpfulness. This recommendation should be made over and above advice to: ensure that the caller is offered information brochures, or referrals, or has made a plan of action during the call, or to improve service accessibility.

It was of interest to determine if the CIH could successfully extend beyond the satisfying reactive service by offering multiple sessions of a brief, structured cannabis use intervention. Such a proactive service would theoretically provide greater
opportunity to establish a strong working alliance through multiple contacts compared to the reactive service. It was considered appropriate to approach the CIH to deliver such an intervention for two main reasons. First, the service received multiple calls each week from cannabis users and the service engendered high satisfaction among its callers. Second, it was noted that, although there were no statistically significant differences between the helpfulness ratings, the service was rated as least helpful in regards to assisting with reducing cannabis use (a mean of 7 out of 10). In addition, less than half of the participants had made a plan of action following the call (40%). As such, it was considered that offering a proactive intervention would enhance the services of the CIH. The creation of this telephone-based intervention is described in Chapter Six and its evaluation is described in Chapter Seven.
CHAPTER SIX:
THE CANNABIS ASSISTANCE HELPLINE
DEVELOPMENT AND EVALUATION METHODS

OVERVIEW

The previous chapter detailed an impact evaluation of the Cannabis Information and Helpline (CIH) and concluded that the majority of callers were satisfied with the service. At the time of evaluation the CIH was a reactive service in that calls to clients were not initiated by the counsellors (aside from returning missed calls) and operations were restricted to attending to incoming calls. It was of interest to determine whether the CIH could deliver a telephone-based cannabis intervention to callers who were interested in receiving assistance in reducing their cannabis use and whether the intervention showed efficacy in comparison to no intervention. The present chapter details the development of a telephone-based cannabis intervention (referred to as the Cannabis Assistance HelpLine, or CAHL) and the methods of its evaluation (referred to as Project CAHL). The results from Project CAHL and the associated discussion are detailed in Chapter Seven.

WHY DEVELOP A TELEPHONE-BASED CANNABIS INTERVENTION?

Although telephone counselling is not typically thought of as a conventional treatment, the development of communication technology and infrastructure has opened the way for telephone counselling to deliver flexible, evidence-based and cost-effective services, nationally. In Australia, telephone counselling is a large, diverse industry with an estimated 171 not-for-profit organisations operating as of July, 2002. Very few of these services, however, target individuals with substance use concerns. Those
services which do assist individuals with substance use concerns typically are reactive, although one notable exception to this is the Australian QuitLine. That is, the QuitLine provides a reactive service as well as an optional ongoing intervention for smokers wishing to reduce their use (a proactive service). The QuitLine model has been found to be efficacious in Australia,\textsuperscript{780} and overseas.\textsuperscript{781} There are several reasons to believe that a telephone service could also be successful in assisting cannabis users reduce their use.

Telephone counselling may be of particular benefit to cannabis treatment seekers as this mode of delivery addresses several of the identified barriers to cannabis treatment seeking. These barriers include 1) poor recognition that cannabis use may be problematic or require treatment, 2) the feeling that accessing treatment will invoke stigma, and 3) problems with accessing treatment due to location or wait lists.\textsuperscript{313, 318-322} Anonymous telephone counselling addresses these barriers by providing individualized and easily accessible information and feedback regarding cannabis use, and counselling that maintains client confidentiality. Moreover, in a survey of 494 cannabis users regarding the barriers and facilitators to cannabis treatment,\textsuperscript{iv} the third most frequently mentioned facilitator was to provide a cannabis-specific telephone counselling service.\textsuperscript{319} Finally, as with the tobacco specific QuitLine, a cannabis specific telephone intervention is associated with several inherent benefits compared to face-to-face services (described in Chapter Three on pp.119-121)

Given the possible benefits of a telephone-based cannabis intervention, it was of interest to determine if such an intervention existed that could be replicated. As briefly described in Chapter Two (pp. 102-104), one such intervention had been trialled previously,\textsuperscript{488} and is described in more detail here.

\textsuperscript{iv} This study was conducted by the candidate and, as it was part of a body of research which identified the possible benefits of a telephone-based cannabis intervention, it is also referenced in Appendix E.
EXISTING PROACTIVE TELEPHONE-BASED CANNABIS INTERVENTIONS

In 2010, Fernandes et al. evaluated a telephone-based cannabis intervention by randomised controlled trial (RCT). Specifically, this trial was of a 20-minute, single session based on the principals of Motivational Interviewing (MI), and included a medium term follow-up assessment at six months. Participants were 1,744 individuals who had sought treatment by calling a specialist cannabis use helpline in Brazil. The results at six month follow-up assessment depicted point-prevalence abstinence rates of 73% for those allocated to the intervention group (n=262), compared to 53% of control participants (n=262). Although these results seem remarkably promising, the study had serious methodological limitations that prevent the generalization of its findings.

First, in the reported treatment outcomes, the period of abstinence achieved was not defined. Further, the reported results were limited to point prevalence abstinence from cannabis and did not include measure of changes in frequency or quantity of use, cannabis dependence, or associated problems at follow-up assessments. Second, over one-third of participants (38%) were receiving concurrent professional help (including psychopharmacological treatment) which was not adequately addressed by the reported data analysis strategy. Third, there was extensive loss to follow-up. The authors conducted seven follow-up assessments beginning at one day post-intervention, with the final follow-up at six months post-intervention. Approximately half the sample dropped out on the day following the MI session, and 70% had dropped out by the six month follow-up assessment. The substantial drop out was not adequately addressed by the reported data analysis strategy. Fourth, the trial did not include any intervention fidelity checks and could not determine that the 20-minute session was delivered as intended by all counsellors or if the self-help materials sent to participants were utilised.
In order to determine the efficacy of a telephone-based cannabis use intervention, a more extensive trial of a cannabis use intervention was warranted. As such, Project CAHL evaluated the efficacy of a four session cognitive-behavioural telephone-based cannabis use treatment by using: treatment fidelity assessments, statistical control for concurrent treatments, a comprehensive assessment of cannabis use and related problems, and participant reimbursement and proactive follow-up to decrease rates of drop-out.

**THE CANNABIS ASSISTANCE HELPLINE PROJECT** *

Project CAHL was an RCT of a group receiving a four-session cannabis intervention based on the combination of MI with cognitive behavioural therapy (CBT), delivered by the CIH staff, and a group allocated to be part of a delayed treatment control (DTC). Given the novelty of this intervention, the first aim of this trial was to determine whether the intervention was delivered as intended. In particular, it was of interest to describe the treatment fidelity, treatment adherence, and the working alliance formed between the participants and the counsellor. The second aim of Project CAHL was to determine whether intervention participants would show a greater reduction in cannabis and other substance use, cannabis-related problems, and cannabis dependence severity, and greater improvements to physical and mental health, compared with control participants. The third aim of this trial was to determine whether the reductions in cannabis use made by participants were clinically meaningful and whether intervention participants showed greater ‘improvement’ compared with control. The fourth aim of Project CAHL was to describe the extent to which several participant characteristics, known to be associated with increasing the likelihood of positive outcomes in face-to-face intervention trials, also

* A version of this and the following chapter regarding Project CAHL has been accepted for publication and is currently ‘in press’ with the *Addiction* journal and is referenced in Appendix E.
were associated with outcomes in this telephone-based intervention. In particular, those variables thought to be associated with improved treatment outcomes included: less entrenched history of cannabis use and exposure to treatment, higher psychosocial functioning, expectation that the treatment will be successful, stage of change and confidence to reduce, using cannabis for experimental or social reasons (as opposed to enhancement, expansion or coping motives), and, a supportive social group of non-cannabis using individuals. Given that confidence to reduce and avoid substance use have been shown to be associated with positive cannabis treatment outcomes, the final aim was to test the hypothesis that the CAHL intervention would promote reductions in cannabis use by enhancing participants’ confidence to avoid cannabis use.

Methods

Participants

A total of 2699 genuine calls (not including hoax or nuisance calls; n=730) requesting information or counselling regarding cannabis-related concerns were received by the CIH during the 14 month participant recruitment phase (August 2009 to January 2011). Of those, one third (n=913; 34%) were seeking counselling regarding a concern relating to their own cannabis use. Of those, 30% (n=274) of callers were interested in participating in Project CAHL and agreed to provide their contact details (see the participant flow diagram; Figure 6.1). Approximately one quarter (n=165; 26%) of individuals who were not interested in providing contact information gave an explanation for their refusal. The three most common reasons were that the caller had already completed the intervention (39%), was already receiving counselling (24%), or would call back after deciding (24%). Approximately three quarters (n=204; 76%) of
the callers who provided contact information were successfully contacted and were
screened for eligibility. From those contacted, a total of 160 (78%) individuals were
eligible and participated, while 44 (22%) were ineligible. Eligible participants were any
individual who: was over 16 years of age; had used cannabis within the past month (11
ineligible); was not receiving concurrent treatment or medication for cannabis use (26
ineligible); did not identify as being dependent on other illicit drugs (4 ineligible); and
had not being hospitalised for a mental health condition related to cannabis use within
12 months (3 ineligible).

Research design

The most accepted method to establish that a particular substance use intervention is
efficacious is to conduct an RCT with intervention fidelity monitoring and post-
treatment participant follow-up. As such, Project CAHL utilised simple random
assignment (www.randomization.com) to place the 160 eligible participants into one of
two conditions: (1) the intervention condition (n=82; 51%), or (2) a delayed treatment
control (DTC; n=78; 49%). A baseline interview and two follow-up assessments (four
and 12 weeks post-baseline) were conducted via telephone for both participant
conditions. The DTC participants did not have access to the intervention until they
completed the 12-week follow-up assessment.
Approval from the Human Research Ethics Committee at the University of New South Wales to conduct Project CAHL with the CIH staff was obtained in January 2009. The details of the intervention model and associated materials were finalised in the first half
of the year and volunteer staff from the CIH were approached to determine which counsellor staff were appropriate for, and interested in, delivering the CAHL intervention.

The training strategy implemented to assist the CIH counsellors deliver the intervention was designed to reflect those aspects thought to be important to the effective delivery of an intervention based on motivational interviewing (MI), as observed by a systematic review of MI adherence measures. That is, counsellor adherence to the principals of training is likely to increase when the training: is delivered over a duration of 24 hours or more, allows for integration into normal practice, and involves observation, feedback and coaching.

A full day workshop was conducted by the candidate, and a trained clinician, at the CIH office and was attended by all 14 CIH staff. The workshop aimed to introduce staff to the intervention and the intended processes of the RCT, and to train the staff to deliver the first intervention session. Following this workshop, staff who indicated an interest in Project CAHL were asked to pair off and audio-tape a role-play of a mock intervention session. From the 14 counsellors who attended the training, six counsellors returned audio-tapes. Along with the candidate, three clinically trained staff of the National Cannabis Prevention and Information Centre assessed these tape recordings. This assessment was conducted utilising a purpose built intervention component rating system. This rating system comprised a score from one to five (rated from “not delivered at all” to “delivered completely and effectively”; see Appendix C [p.77 of the treatment manual]) for each of 14 procedures that would be completed in the first session (for a total possible score of 70). At least three raters scored each audio-tape. The pooled ratings indicated that all the scores for all counsellors were acceptable.
considering the early stage of training (average score of 49.2, $SD=11.4$). A correlation analysis found no statistically significant differences between counsellors’ (all $p>0.06$) or between raters’ scores (all $p>0.10$). As the CIH could not accommodate a greater number of staff participating in the RCT, the top four scoring counsellors were selected for further training (these counsellors scored a total average score across raters of 64.0, 54.9, 53.2 and 45.8). These counsellors all had at least one year experience in telephone counselling, a tertiary qualification in telephone counselling or equivalent (such as a TAFE awarded Certificate IV for telephone counselling [program code CHCAOD1C]), and had attended NCPIC in-house training (the ‘Everything you need to know about cannabis’ course).

These four counsellors were given a hard copy of the *Cannabis Assistance Helpline Treatment Manual* (see Appendix C) and the *Quitting Cannabis Workbook* (available at [http://ncpic.org.au/static/pdfs/training-and-workshops/quitting-cannabis-workbook.pdf](http://ncpic.org.au/static/pdfs/training-and-workshops/quitting-cannabis-workbook.pdf)) to assist in continuing their training to deliver the intervention. Two additional full day workshops were conducted by the candidate and a qualified clinician to train the four selected CIH staff to deliver the full intervention and orient them to the project materials. The workshops consisted of two supervised role-plays to practice each of the remaining three intervention sessions and feedback was given by the candidate. For the duration of the intervention trial, the counsellors were supervised by a CIH staff team leader who also acted as the first point of contact when coordinating the transfer of project materials. Two face-to-face meetings were conducted with this staff member to ensure the trial protocol for transferring project materials was fully understood. Finally, the candidate was available via email and attended monthly CIH staff meetings throughout the trial duration to ensure the counsellors had no outstanding questions regarding trial participation.
**Intervention conditions**

**The CAHL intervention condition**

The CAHL intervention consisted of four, 60 minute counselling sessions, conducted one-week apart (mean=7.1 days, SD=0.6), beginning one week after the baseline interview (mean=7.78 days, SD=5.18). Specifically, the CAHL intervention was modelled on the manualised principles and techniques outlined by Martin et al.’s MI-based “Cannabis Check-Up”, coupled with the CBT procedures outlined by Rees et al.

The first intervention session utilised a non-judgmental supportive listening approach while incorporating MI techniques (such as expressing empathy, developing discrepancy or highlighting slip ups, avoiding argumentation, rolling with resistance and supporting self-efficacy). The initial session was designed to achieve five goals: 1) actively explore the participant’s problem situation and personalise the health effects of smoking; 2) utilise the Personalised Feedback Report (PFR; see appendix C [p. 66 of the treatment manual]) to advise the participant regarding their level of cannabis dependence in comparison to normative data from the 1997 Australian National Survey of Mental Health and Wellbeing (the most recent data available at the time of the trial); 3) provide relevant information and advice as necessary; 4) set a change date and schedule a plan to reduce cannabis by one third each week; and 5) organize the timing of the subsequent session. In addition, the participant was introduced to the CAHL model as a whole and was assisted in the use of the intervention self-help materials (see the Materials section on p. 247 for more detail).

The second session also observed MI principles and aimed to assist participants in identifying their thoughts, feelings, and behaviours that lead to cannabis smoking. In
addition, this session focused on identifying the context within which the individual’s cannabis use typically occurs and introduced some initial CBT-based techniques including the ‘decisional balance’. This session was designed to achieve four main goals: 1) reconnect with the participant; 2) identify the participant’s high-risk situations and triggers to using cannabis; 3) conduct a ‘decisional balance’ and, when possible, outweigh the pros with the cons of smoking; and 4) identify any potential road blocks that may impede the participant’s motivation to reduce use (such as a party where people will be smoking), and assist the participant in identifying emergency plans to cope with these road blocks.

The third intervention session was designed to help increase the participant’s set of strategies that could be used to avoid smoking. This session took on more of a CBT-based approach although the counsellors maintained awareness of the participant’s motivation to change. That is, at the counsellor’s discretion participants with low motivation would repeat aspects of the first two sessions to improve upon building motivation, while motivated participants would move on to developing change skills. In particular, this session was designed to achieve three main goals: 1) reconnect with the participant; 2) ensure the participant has emergency plans and strategies to draw from when offered cannabis; and 3) identify the participant’s cognitions that lead towards smoking and expectancies surrounding cannabis use.

The final intervention session was designed to reinforce all the previous sessions by establishing weak points in the participant’s skills and bolstering them. In addition, this session was designed to leave the participant with sufficient skills to continue their cannabis reduction in the absence of treatment. As such, the final session had five main goals: 1) identify and address any need to re-educate the participant on coping
strategies; 2) inform on what to expect in the event of relapse and educate on relapse prevention techniques (such as rationalising, preparing for loss, self-monitoring and self-rewards); 3) ensure the participant had adequate social support in the absence of the CAHL program; and 4) ensure the participant has confidence in continuing cannabis reduction in the absence of the CAHL program. As in session three, this session was designed to be flexible for participants who were unable to reduce cannabis use and focused on enhancing motivation and readdressing the main goals of the first two sessions where appropriate. The particular cases where this was appropriate were left to counsellor discretion.

In addition, in each counselling session the participants were instructed to utilise the *Quitting Cannabis Workbook* to complete self-help activities, solidify the ‘teachings’ of each session, and prepare the participant for the session to come.

*Delayed Treatment Control (DTC) condition*

Following the initial assessment, participants who were randomly allocated to the wait-list control group were advised that they could begin treatment in 12 weeks. Participants were not offered any treatment during this time. As with the intervention group, no participants were prevented from seeking concurrent treatment elsewhere (although such activity was taken into account in the data analysis).

**REGARDING THE DEVELOPMENT OF THE CAHL INTERVENTION**

The CAHL intervention was developed based on a literature review of face-to-face cannabis use intervention trials (see Chapter Two) and telephone-based counselling in the field of substance use (see Chapter Three) and was informed by the information gained from a process and impact evaluation of the CIH (see Chapter Four and Chapter
Five, respectively). The reviewed literature highlighted nine factors which were cited to be associated with positive treatment outcomes. Specifically, significant predictors of treatment outcomes were: 1) the treatment seeker’s motivation to avoid use and the flexibility of counselling sessions to attend to the client’s changing motivation and treatment needs;\textsuperscript{563, 440, 596} 2) the degree of genuineness and empathy between caller and counsellor (referred to as working alliance);\textsuperscript{459, 727, 730, 809-811} 3) the counselling style utilised (MI and CBT based interventions shared the largest evidence base);\textsuperscript{299, 329, 402} 4) the suggested reduction technique (reducing over time was recommended over going “cold turkey”);\textsuperscript{812, 813} 5) the number and length of sessions (the treatment outcomes of intensive interventions may not justify the extra resources needed compared to brief interventions which show comparable treatment outcomes) and treatment adherence (completing all the intervention sessions is expected to engender greater treatment outcomes than partial completion);\textsuperscript{350, 355, 557, 611, 814} 6) the timing from one session to the next (sessions are ideally delivered before a cessation attempt and again within two weeks following a cessation attempt);\textsuperscript{15, 557, 575, 576, 814} 7) the inclusion of self-help materials (self-help materials are thought to improve on telephone intervention outcomes);\textsuperscript{577, 598, 815-818} 8) the presence of a supportive social group (non-using friends in particular can assist with tobacco use reductions,\textsuperscript{819-823} and cannabis use reductions\textsuperscript{784, 803, 804}) and 9) the fidelity of treatment delivery (sessions are delivered as intended through counsellor training and the use of a treatment manual).\textsuperscript{824, 825} These factors played a major role in the development of the CAHL intervention and are described in detail here.
Treatment seeker’s motivation and confidence to avoid use

The counsellors were instructed to always be mindful of the participant’s motivation and confidence to reduce use (sometimes referred to as ‘self-efficacy’ to reduce). Encouraging this mindset was thought to be important for three main reasons. First, self-efficacy is thought to be fluid and can waiver over time. When self-efficacy to reduce substance use is low, relapse to substance use is intuitively more likely. Second, in regards to tobacco cessation treatment, the treatment seeker’s self-efficacy for behaviour change have each been thought to be associated with treatment outcomes for several decades. This finding has been consistently supported in face-to-face substance use treatment evaluation, as well as in telephone counselling for tobacco cessation. Third, the cannabis treatment seeker’s self-efficacy to quit cannabis use also has been investigated by a handful of cannabis intervention trials, and an association between greater treatment outcomes among those with greater baseline self-efficacy has been supported.

Working alliance

The CAHL intervention developed each session to begin with an initial component designed to establish rapport with the clients, and increase the probability of forming a strong working alliance to facilitate changes in substance use. This process was incorporated for two main reasons. First, variables thought to be common to many different theoretical orientations of counselling, or ‘common factors’, are thought to have a significant impact on treatment outcomes. Notably, the common factor thought to have the greatest influence on treatment outcomes in the short term is the working alliance, or the warm, empathic relationship between a counsellor and client. Second, in addition to actively exploring a problem situation, assessing
the need for information and guidance, and fulfilling this need, working alliance was shown to be a predictor of caller satisfaction with the CIH service (see Chapter Five) and these factors are also argued to be important to effective counselling. Indeed, many counselling services identify the importance of developing a strong working alliance and specifically counsellor’s attending skills.

Counselling style

The CAHL intervention was a MI and CBT combined intervention (MI+CBT). Specifically, the MI-based components were modelled on Martin et al.’s “Cannabis Check-Up”, while the CBT-based procedures were modelled on the six-session intervention trialled by Copeland et al. (manualised by Rees et al.). The CAHL intervention as developed as a MI+CBT-based intervention for two main reasons. First, although it is widely held that any treatment for substance use is likely to be beneficial, not all approaches are equally beneficial. Several counselling styles have been employed in cannabis intervention trials and are discussed at length in Chapter Two. The two counselling styles most commonly utilised in cannabis treatment research are MI and CBT and the combination of these styles has been advocated by three cannabis treatment review articles. These review articles address an evidence base of nine trials of MI+CBT-based interventions, each reporting positive outcomes in treating cannabis use.

Second, the integration of MI and CBT counselling styles is not unusual in substance use treatment as they are not mutually exclusive. That is, as MI is suited for individuals who are contemplating reducing use, and CBT is suitable for individuals who are in preparation or action phases, a logical order would be to begin with MI and move to CBT. In this way MI may enhance and solidify readiness to change, while
the shift to CBT techniques may aid the active process of making changes. In a review of 29 trials of MI-based intervention studies for problem behaviours including substance use, it was found that, when motivational sessions and more intensive CBT-based sessions were combined in this way, treatment outcomes were the most positive.

An early MI+CBT-based intervention timed the transition from motivational techniques to cognitive behavioural techniques based on manual driven protocol. More recent studies, however, have emphasised a focus on the client’s own motivation level to understand when it is best to move between these counselling styles. In the present intervention, a combination of these strategies was used. That is, the first two sessions were designed to build on the participant’s motivation to change and the second two sessions were designed to build on the commitment to change and develop a plan specific to the participant to assist with change. Notably, each session began with checking the client’s motivational levels and would adjust to use the most suitable counselling style.

Reduction technique

The CAHL intervention recommended participants spread out their cannabis use throughout the day (if the participant was employed or otherwise unable to spread out use in this way, the participant was encouraged to at least avoid “chain” smoking and spread out their use when at home) and attempt to reduce their cannabis use by one third each week. In the absence of cannabis specific data, this recommendation reflected the work of Cinciripini et al. regarding the most effective strategies for reducing tobacco smoking. These authors found that, compared to unscheduled reductions and reductions made without fixed intervals between use, a scheduled reduction of fixed
intervals by one third was associated with a greater likelihood of maintaining abstinence at 12 month follow-up assessment (44% for progressively increasing a scheduled reduction, compared to 18% when reducing without scheduling a period in which the reduction should be made, 32% when scheduling time periods for smoking prior to going cold turkey, and 22% when reducing without direction or ‘cold turkey’).  

**Number and length of sessions**

The CAHL intervention was designed to be a four session intervention with sessions delivered one week apart. This number of sessions was chosen for three main reasons. First, previous MI-based interventions have typically utilised between one and four sessions. Second, a meta-analysis of telephone-based tobacco cessation interventions highlighted that those trials with six or more sessions did not reliably show greater outcome than those with two sessions. In addition, four counselling sessions was shown to be associated with improved outcome compared to two or fewer sessions. Third, in cannabis treatment, although there is no consensus as to a particular number of counselling sessions that is thought to be best practice, no statistically significant difference in outcomes was found between a five and 12 session MET+CBT-based cannabis intervention, and there is support for a four session MET+CBT cannabis intervention - the briefest of this kind of intervention trialled to date.

In delivering these sessions the counsellors were instructed to encourage participation in all four sessions as well as the follow-up assessments. That is, participants were given self-help tasks as a bridge between the sessions, and the counsellors deliberately organised a convenient time for the participant to attend the next intervention session at the end of each treatment session. At the end of the fourth session a convenient time for the four-week follow-up interview was agreed.
The timing from one session to the next

The intervention duration of four weeks was chosen for four main reasons. First, it was thought that the participants would require a number of days to attempt and complete the self-help tasks assigned to be completed between the telephone sessions. Second, the counsellors delivering the intervention were working part-time and at times were only available for one day per week. Third, a longer duration was thought to be wasteful of resources given that an investigation of a face-to-face cannabis intervention failed to show any statistically significant difference in the reductions in cannabis use achieved by participants who received the intervention over one month to those receiving the same intervention over three months.\(^{338}\) Fourth, assuming the participants began to reduce their use following the first session, delivering the intervention over one month would allow for participants to receive assistance at times of need. That is, the duration of withdrawal following cessation of cannabis use is well described, and the majority of symptoms are thought to abate approximately one to two weeks from cessation.\(^{15}\)

Further, symptoms of withdrawal have been shown to be associated with relapse to cannabis use in some studies,\(^{835, 836}\) but this finding has not been consistent.\(^{837}\)

The duration of individual sessions of approximately one hour was chosen for three main reasons. First, this length was consistent with several previous cannabis use intervention trials.\(^{341, 342, 345, 352, 353}\) Second, there has been no research to support the use of individual sessions of greater duration. Indeed, the call satisfaction reported by CIH callers was not associated with call duration in the impact evaluation described in Chapter Five. Third, this session time was thought to be a fair compromise between a preference for session brevity (due to the reduced labour requirements and reduced stress on counsellors) and the importance of including adequate session content.
Self-help materials

The use of self-help materials in Project CAHL was based on a significant body of supportive evidence. That is, several authors have investigated the utility of self-help materials, on their own, in conjunction with face-to-face treatment, and in conjunction with telephone-based interventions. This extensive evidence base indicates that self-help materials are a relatively cost-effective means of achieving reductions in tobacco smoking and may not require any additional intervention to achieve positive treatment outcomes. Yet according to a Cochrane review article, and several more recent trials, the utility of including self-help materials (in terms of improving trial adherence and treatment outcomes) is likely to be strengthened when the materials are included to be complementary to, or in conjunction with, telephone-based counselling. Unfortunately there is limited research regarding the effect of materials of different contents or length. Among the limited evidence is suggestion that tailoring the content of materials to the individual’s level of use and motivation to change can engender greater treatment outcomes compared to standard materials, although the effect is likely to be small.
Social support

The final session of the CAHL intervention focused on the social support contacts available to the participant. In addition, referrals to Lifeline and the CIH reactive services were offered when appropriate to ensure that the participant had some form of available social support post treatment. This focus on social support was integrated as many trials of substance use interventions (particularly smoking cessation interventions) have detailed the utility of a concurrent supportive social group to increase the chance of positive treatment outcomes when attempting to reducing substance use, and cannabis use in particular. The participants were encouraged to associate with supportive non-cannabis using friends where possible as their support has been shown to be more predictive of positive outcomes compared to smoking friends.

Treatment Fidelity

To ensure that any intervention can advance from the initial stages of research to successful real-world use, it is necessary to ensure that counsellors are competent and adhere to intervention protocols. The importance of counsellor competence and adherence to protocol – or treatment fidelity – has been long established in general substance use treatment. Cannabis interventions are no exception, and recent study has highlighted that cannabis treatment fidelity is associated with treatment outcomes. As such, two steps were taken in Project CAHL to address treatment fidelity. First, an extensive counsellor training course was delivered (see p. 234) which included reference to a treatment manual. Second, adherence to protocol was measured following each intervention session using a custom fidelity measure. The treatment manual and the fidelity measure are each described in the following chapter section (on pp. 248 and 250, respectively).
PROJECT CAHL - MATERIALS

A number of documents were required for the successful delivery of Project CAHL. These documents, and their role in Project CAHL, are described in detail here.

The Consent Form and Screener Sheet

As the participants of Project CAHL were recruited from individuals who called the CIH service, the CIH counsellors kept hard copies of the Participant Information and Consent Form (see Appendix C [p. 63 of the treatment manual]) and the Screener Sheet (see Appendix C [p. 65 of the treatment manual]) at hand throughout the trial duration. The Screener Sheet detailed the trial inclusion criteria, and those callers who met inclusion criteria were informed about the trial using the Information and Consent Form. The CIH counsellors were asked to stress three important points read from this form: 1) that all information provided during the trial would be kept confidential (except in the case of mandatory requirements set by the Australian Psychological Society such as where actual or intended harm to any individual or certain serious criminal activity was reported); 2) there would be no guarantee of direct benefit from participating, however, a $30 Coles-Myer gift-voucher reimbursement would be sent by mail upon completion of each follow-up assessment; and 3) participants would be free to withdraw from the trial at any time without repercussion for the University of New South Wales, NCPIC, or the CIH. In addition, following baseline assessment, each trial participant was offered to be sent a hard copy of the Consent Form via mail.

The Participant Contact Form

The Participant Contact Form (see Appendix C [p. 66 of the treatment manual]) included the participant’s identification code (a four digit number recorded of every
caller to the CIH) along with a home phone and mobile number for the participant and any close friends or family members if the participant felt they could help the CIH counsellor make contact. The form was then used when intending to contact the participants and included space for the counsellor to record the number of contact attempts and the date the attempts were made.

The Treatment Manual

Manualised treatment is one strategy to improve the balance between the internal validity (emphasising experimental control) and external validity (or the ‘generalisability’) of an intervention. As such, the *Cannabis Assistance Helpline Treatment Manual* (see Appendix C) was finalised in April, 2009. The manual was designed to provide a complete overview of the trial protocol, in addition to the content (and suggestions on content delivery) for each of the four counselling sessions. The manual was a stand-alone reference guide for the CIH counsellors and included an appendix of the materials that would be required throughout the trial. The manual was introduced to the CIH staff to assist with intervention training and was kept at hand by the counsellors throughout participation in the trial.

The Session Quick-guides

To promote the successful delivery of Project CAHL, the counsellors were issued with summary sheets, or *Quick-guides* (see Appendix C [p. 81 of the treatment manual]), detailing each of the main tasks to be completed for each of the four intervention sessions. The *Quick guides* were essentially simple summaries of the intervention protocol presented in the *Treatment Manual*. 
The Quitting Cannabis Workbook

The *Quitting Cannabis Workbook* (available at [http://ncpic.org.au/static/pdfs/training-and-workshops/quitting-cannabis-workbook.pdf](http://ncpic.org.au/static/pdfs/training-and-workshops/quitting-cannabis-workbook.pdf)) was designed to complement the six session CBT cannabis intervention by Copeland et al. that the CAHL intervention was modelled on.\(^342\) The *Workbook* was utilised throughout each CAHL intervention session and participants were encouraged to use it to complete self-help tasks between sessions. The four CAHL intervention sessions covered the material from the six *Workbook* sections as detailed in Table 6.1.

### Table 6.1 CAHL intervention sessions and the associated ‘Quitting Cannabis Workbook’ sections

<table>
<thead>
<tr>
<th>CAHL Intervention Session</th>
<th>Workbook section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1: Cannabis and the participant</td>
<td>Section 1: Cannabis and you</td>
</tr>
<tr>
<td>Session 2: Preparing for change</td>
<td>Section 2: Preparing for change</td>
</tr>
<tr>
<td>Session 3: Strategies for change</td>
<td>Section 3: Strategies for change</td>
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<tr>
<td>Session 4: Putting it all together</td>
<td>Section 4: Managing withdrawal</td>
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<td></td>
<td>Section 5: Putting it all together</td>
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<tr>
<td></td>
<td>Section 6: Relapse prevention</td>
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</tbody>
</table>

The Cannabis Use Self-Monitoring Diary

The *Cannabis Use Self-Monitoring Diary* (Appendix C [p. 76 of the treatment manual]) was mailed to intervention participants immediately following the baseline assessment, and allowed them to record their thoughts and feelings associated with each occasion of cannabis use throughout the trial. Participants were encouraged to complete the *Diary* to facilitate: 1) the identification of discrepancies between goals and current behaviour, 2) feedback regarding cannabis use frequency, and 3) taking responsibility for change. In this way, the *Diary* was an important tool which reflected three elements associated
with effective motivational interventions. In addition, the Diary allowed participants to report ‘mastery’ ratings over how well they felt they had controlled their cannabis use and facilitate the connection between self-responsibility and changes in cannabis use. The CAHL counsellors also were able to use this information to provide feedback regarding cannabis use and how it related to the participant’s intended goals.

The Clinician Checklists

In order to improve the generalisability of an intervention, it is important to record both treatment outcomes and how well the protocol is enacted, or ‘treatment fidelity’. Measuring treatment fidelity can be accomplished by utilizing tape coding systems such as the Motivational Interviewing Skill Code (MISC) or adaptations of the MISC, such as the Motivational Interviewing Treatment Integrity code (MITI). In addition, a fidelity measure for integrated MI+CBT interventions also was recently developed. Although expert raters are not needed to measure treatment fidelity using these measures, they are designed to be implemented when the counsellor and client are audio-taped during an intervention session such that occurrences of specific counsellor behaviours can be tallied.

As the CAHL intervention was delivered without the facility or ethical permission to record the intervention sessions, a purpose built treatment fidelity measure was created – the Clinician Checklists (see Appendix C [p. 77 of the treatment manual]). The Checklist comprised a list of the main tasks to be completed for each session, and how long each task was expected to take. Thus, each component of each session was rated on a 1-5 Likert-type scale (from “not delivered at all” to “delivered completely and effectively”). Both the CAHL counsellors and the candidate used the Checklists to measure treatment fidelity. When possible the candidate was on location at the CIH
with the counsellor in order to listen to the counsellor deliver the session in person but could not hear the participant (who was on the telephone with the counsellor). The counsellors were instructed to complete the Checklist immediately following each session.

The Participant Feedback Report

The Participant Feedback Report (PFR; see Appendix C [p.67 of the treatment manual]) comprised a summary of the baseline interview regarding the participant’s cannabis use and related behaviours. This information was collated, scanned, and sent to the CIH via email to be printed out and kept in a locked filing cabinet. The PFR was utilised by the counsellors for three main reasons. First, the counsellors provided the participant with feedback on their cannabis use behaviours and the severity of their cannabis dependence. Second, the counsellors illustrated the proportion of the Australian population and the proportion of recent cannabis users who are cannabis dependent (in equivalent age groups and gender to the participant). This information was provided by the most recent data available - the 1997 Australian National Survey of Mental Health and Wellbeing. Third, the PFR allowed for the counsellors to take notes during sessions in order to assist with case management.

The Working Alliance Short Form

Immediately following a participant’s completion of the four sessions in the intervention (or at the time of drop out for non-completers), the CIH counsellors answered the counsellor version of the Working Alliance Inventory Short-form questionnaire (WAI-S). This validated measure was utilised to indicate the strength of the working alliance formed between the counsellor and participant – an aspect important to the intervention design and a strong predictor of treatment
outcomes.\textsuperscript{459, 727, 730, 742} Scores ranged from 12 to 84, with higher scores indicating a stronger working alliance. The counsellor ratings on this 12 item scale showed good internal consistency (\textit{Cronbach} $\alpha$ =0.74).

**PROJECT CAHL - MEASURES**

The Project CAHL measures consisted of a baseline assessment conducted prior to participant randomisation which was essentially repeated at four (immediately following treatment end for intervention participants) and 12 weeks later. The baseline and follow-up assessments are detailed here and can be found in Appendix D.

**The baseline assessment**

The baseline assessment consisted of a structured interview that was conducted in approximately half an hour (\textit{mean}=37.2 minutes, \textit{SD}=2.5). In part, the interview was designed to assess three relevant and independent cannabis treatment outcomes: quantity and frequency of cannabis use, cannabis dependence severity, and cannabis-related problems.\textsuperscript{478} In addition to the cannabis-related problems, the participants were asked to describe their general physical and mental health, and the frequency of other substance use. Finally, several questions were asked only at baseline interview that were regarding participant demographic characteristics and other variables that have been associated with predicting treatment outcomes. The choice of instruments used and reason for their inclusion are discussed here.

**Demographic details**

Demographic details were collected utilising the National Minimum Data Set for Clients of Alcohol and Other Drug Treatment Services (NMDS-AODTS).\textsuperscript{301} This dataset was chosen to match all Australian publicly funded drug or alcohol treatment
agencies which are mandated to collect these data elements. In addition, participants were asked to confirm which bracket of annual income was appropriate to them, and what levels of education they had completed. As depicted in Table 6.2, this information informed the computation of a Socio-Economic Status (SES) scale based on Australian Bureau of Statistics indices of economic advantage or disadvantage (ranging from -4 to +4, representing extreme disadvantage to extreme advantage). These indices are associated with statistically significant variance in reported treatment outcomes such that greater socio-economic status is associated with increased likelihood of positive substance use treatment outcomes in the short-term.

<table>
<thead>
<tr>
<th>Index of relative disadvantage</th>
<th>SES score</th>
<th>Index of relative advantage</th>
<th>SES score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual household income below $20,800</td>
<td>- 1</td>
<td>Annual household income above $52,000</td>
<td>+ 1</td>
</tr>
<tr>
<td>Participant did not complete high school education</td>
<td>- 1</td>
<td>Participant has attended university, or has a diploma qualification</td>
<td>+ 1</td>
</tr>
<tr>
<td>Participant is unemployed</td>
<td>- 1</td>
<td>Participant is employed in a professional position</td>
<td>+ 1</td>
</tr>
<tr>
<td>Participant lives alone, or alone with children</td>
<td>- 1</td>
<td>Participant lives with partner or family</td>
<td>+ 1</td>
</tr>
</tbody>
</table>

Note: A score of 0 is given for each of the four indices where a score of -1 or +1 does not apply

**Quantity and frequency of cannabis use**

There is no standard way of measuring a participant’s cannabis use, although research including a measure of cannabis use typically emphasizes frequency of use. One approach to improve the reliability of self-reported frequency of cannabis use is to use the TimeLine Follow Back (TLFB) interview which assists memory recall by using memory aids such as calendars and milestone events. As such, cannabis use frequency and quantity was recorded per-day on a 28-day TLFB interview that included an additional question of how many hours the participants would typically feel high or
stoned on cannabis during a typical day of use. To promote consistency when addressing the quantity of cannabis used, the use of joints was converted to cones using a published conversion rate of three cones to one joint.763, 764

Other aspects of cannabis use

To assist the CAHL counsellors in identifying the ‘cons’ associated with a participant’s cannabis use, information concerning how much money the participant spent on cannabis per week was collected. In addition, to provide background information regarding cannabis use, the participants were asked their age (in years) at the time of initial use and initiation into frequent (at least weekly) use. Finally, the participants were asked an open-ended question to identify what motivated them to use cannabis on their most recent, typical and initial occasion of use. The participants’ description of what most commonly motivated them to use cannabis was categorised into one or more of seven motive categories: enhancement motives (such as “to get high”), coping motives (such as “to forget my worries”), social motives (such as “to enjoy a party”), conformity motives (such as “to fit in with a social group”), expansion motives (such as “to expand my awareness”), relieving boredom (such as “smoking for something to do”) and medicinal use (such as “to help sleep”, or “to relieve pain”).

Severity of cannabis use and related problems

The participant’s severity of cannabis dependence was assessed using the validated Severity of Dependence Scale (SDS).867 This measure has been found to have good psychometric properties as a measure of dependence among heroin, cocaine, amphetamine, benzodiazepine, and cannabis users.867-869 Participants answer five items relating to aspects of cannabis dependence (rated from 0-3) and a total score of at least three (out of 15) is indicative of dependence.869 At four- and 12-week follow-up
assessments the SDS showed good internal consistency (α=0.80, and 0.87, respectively). At baseline, however, the SDS showed questionable internal consistency (α= 0.61), meaning that the reliability of this scale was uncertain for this assessment.

Details regarding the experience of problems associated with cannabis use were collected utilising the Cannabis Problems Questionnaire (CPQ). The CPQ was developed to address a lack of psychometrically sound measures of cannabis-related problems. The CPQ is a 22-item measure of acute physical, psychological and social consequences of cannabis use (such as “Have you sold any of your belongings to buy cannabis?” or “Have you been physically sick after smoking?”). The more items a participant endorses the more problematic their cannabis use. At baseline, four-week, and 12-week follow-up assessments, the CPQ scale showed good internal consistency (α= 0.82, 0.87, and 0.88, respectively).

**Physical and mental health**

Levels of psychological distress were measured utilising the Kessler-10 psychological distress scale. This general screening instrument has been validated and is used in the Australian National Survey of Mental Health and Wellbeing, and the Australian National Drug Strategy Household Survey. Participants rate how often they experience a set of ten problems relating to psychological distress on a 1-5 Likert-type scale (from “none of the time” to “all of the time”). Higher Kessler-10 scores are indicative of higher levels of anxiety and depressive symptoms. At baseline, four-week, and 12-week follow-up assessments, the Kessler-10 scale showed good internal consistency (α=0.72; 0.84; and 0.86, respectively)

The EuroQol five dimension (referred to as the ‘EQ-5D’) well-being index and physical health scale was used to indicate the participant’s health-related quality of life. The
EQ-5D is a generic instrument designed to complement other quality-of-life measures (in this instance, the Kessler-10 scale) in the measurement of health-related quality of life. It provides five dimensions of health (mobility, self-care, social, pain, and psychological), each with three levels, or “health states”. Thus, the measure yields one of a possible 243 (3^5) health states. Each of these health states are then given a utility score (their value to the patient) which is transformed to lie on an interval from -1 to 1 (referred to as the EQ-5D index). Due to an absence of Australian population data for this transformation, US ‘preference weights’ were utilised given the similarities in drug use patterns and demographics between the two countries. For a five item scale the EQ-5D index showed acceptable internal consistency at four- and 12-week follow-up (α=0.73, and 0.70, respectively). At baseline, however, this scale showed questionable internal consistency (α=0.60), meaning that the reliability of this scale was uncertain at this assessment. The EQ-5D also includes a scale assessing the participants’ general physical health between 0 and 100 (from “worst state imaginable” to “best state imaginable”). As such, this scale score provides an overall numeric estimate of their health-related quality of life (referred to as the EQ-5D health scale).

Other substance use

Participants were asked to detail how many days in the previous 90 days they had used alcohol, tobacco, or any illicit drug, and whether they had ever used these substances. The TLFB interview method was not utilised to measure other substance use in order to promote the brevity of the assessment given that cannabis typically is used in conjunction with a number of other substances. In addition, as it is common for Australian cannabis users to smoke cannabis and tobacco concurrently, and the concurrent use of tobacco and cannabis predicts persistence in cannabis use,
participants were asked if they usually mixed tobacco with cannabis when smoking and, if so, what percentage of the joint or cone was muddled with tobacco.

**History of cannabis use reductions**

In the absence of a gold standard measure of treatment history, participants were simply asked whether or not they had tried to reduce use within 12 months of the baseline assessment. Participants who had tried to reduce use were asked how many times they had tried, and what strategy they had used on the most recent occasion. This information was used to inform CAHL counsellors on possibly ineffective or potentially effective strategies when giving feedback to the participant. In addition, the participants were asked whether or not they had sought any professional help for their cannabis use or had used any medications to assist with reducing cannabis use.

**Readiness to change and confidence to avoid cannabis use**

A commonly used and recommended indicator of a participant’s readiness to change substance use is DiClemente and Prochaska’s five stages of change. As such, the participants were asked to indicate which of the five stages of change (pre-contemplation, contemplation, determination of action, action, maintenance) best described their readiness to reduce cannabis use at baseline. This information was used to assist the CAHL counsellors in identifying the most appropriate level of ‘change talk’ to use during the initial session. In addition, in the absence of a gold standard measure of confidence to avoid cannabis use, participants were asked the single item question: “how confident are you in avoiding cannabis use without further professional help?” at baseline and follow-up interviews. Responses were recorded on a 0-10 Likert scale (from “not at all confident” to “extremely confident”; hereby referred to as the ‘confidence scale’) based on Stephens et al.’s self-efficacy index. These authors
reported that the index demonstrated good test-retest reliability ($\alpha=0.89$ and 0.94 at pre and post assessments, respectively).

**Social support**

The participant’s level of social support was collected utilising the six item Social Support Questionnaire (SSQ-6). The SSQ-6 offers a reliable, valid and convenient measure of social support. Each item in this six item scale has two parts. The first part asks the participant to identify how many support persons he or she can turn to in a number of different situations. The second part assesses how satisfied the participant is with the perceived support that is available on a 0-5 Likert-type scale (from “very dissatisfied” to “very satisfied”). As such the scale yields two scores: ‘number of friends’ and ‘satisfaction with friends’. The SSQ was conducted at the baseline assessment and showed good internal consistency for ‘number of friends’ ($\alpha=0.80$) and ‘satisfaction with friends’ ($\alpha=0.93$).

**Treatment expectations**

Treatment expectations have only very recently been observed in substance use treatment by Raylu and Kaur. In mental health research, however, the measurement of treatment expectations is not unusual, and the 66 item Expectations about Counseling Questionnaire is commonly used. This measure, and even the short-form version (53 items), were each thought to be too lengthy for use in the present study. Instead, treatment credibility was measured by an adapted version of the brief Credibility/Expectancy Questionnaire (CEQ). The CEQ includes items regarding how logical the intervention seems, how confident that participants would be that the intervention would assist them, and how confident they would be in recommending the treatment to a friend (rated on a Likert-type scale from one to nine), and what
percentage of improvement in symptoms would occur. The CEQ has demonstrated high internal consistency and test-retest reliability ($\alpha=0.81-0.86$ and $r=0.75$, respectively).\textsuperscript{884} In the present study, the Likert-type CEQ items were adapted to relate to a telephone-based cannabis intervention and this new ‘credibility scale’ showed reasonable internal consistency for a scale with three items ($\alpha= 0.66$).\textsuperscript{885}

**The follow-up assessments**

The follow-up assessments were conducted at four and 12 weeks after the baseline interview by the candidate. These interviews were a repetition of the initial assessment, although the demographic questions and predictors of treatment outcome were omitted to avoid redundancy, as were the questions included to primarily inform the counsellors as to the participants’ entrenchment in cannabis use including weekly expenditure and their stage of change. An exception to this was the measure of confidence to avoid cannabis use which was included in each assessment as it is thought to be dynamic and fluctuate when reducing substance use, is core to MI.\textsuperscript{859} and has been shown to predict cannabis treatment outcomes.\textsuperscript{347, 805}

Just as counsellors were asked to complete the Working Alliance Inventory Short-form questionnaire (WAI-S) following the intervention, so to were the intervention participants.\textsuperscript{741, 862} The WAI-S was used to measure the perceptions of the participant and the counsellor regarding the strength of the working alliance formed and was conducted as part of the four-week follow-up. This questionnaire showed acceptable internal consistency among intervention participants and among the counsellors (Cronbach $\alpha=0.74$ for both groups).
PROJECT CAHL - PROCEDURES

During the recruitment period of Project CAHL (from August 2009 to January 2011), each caller to the CIH who mentioned an interest in receiving help to reduce their cannabis use was informed about Project CAHL by CIH staff. The counsellors at the CIH were requested to keep a log for each caller to the CIH and record instances when the caller was informed, or was not informed, of Project CAHL and if the caller was interested, or not interested, in participation. Interested callers were asked to give their verbal agreement to participate and, if consenting, were asked for contact information. The Participant Contact Form was then completed and forwarded to the candidate via email.

Using the Contact Form, the candidate attempted to contact interested individuals twice a day for five business days in order to complete the baseline assessment. Failing to make contact during this time resulted in removing the individual from the trial. Immediately following the baseline assessment, the candidate allocated the participant to one of the two participant groups using simple random assignment (www.randomization.com). Simple random assignment, as compared to using blocking variables, was chosen as recruitment into the study was not expected to be fluid or large, and there was no a priori reason to assume variance between the participant groups. Participants allocated to the intervention group were mailed a copy of the Workbook and the Cannabis Use Diary along with a copy of the Consent Form. Participants allocated to the control group were mailed a copy of the Consent Form only. For intervention participants, the candidate completed the Participant Feedback Report and emailed a scanned copy to the CAHL counsellors. The participant was not sent a copy of the Report as the study design was intentionally limited to verbal discussion of the
participants’ cannabis use, as would be the case in any continuation of the intervention following the research trial. Although the participant was sent a copy of the Workbook and Diary, these materials are freely available to be downloaded from the NCPIC website (www.ncpic.org.au) and would be a feasible part of the intervention continuation and ensure sustainability in the real world.

In order to conduct the first intervention session, the supervising CAHL counsellor utilised the Contact Form to call the intervention participants and arrange a time for the first session to begin. Those who completed the four intervention sessions completed the intervention a median of 21 days from the initial session (mean=21.20, SD=1.85) and the ‘four-week’ follow-up assessment was conducted a median of 32 days (mean=34, SD=8.0) from the baseline assessment by the candidate. The ‘12-week’ follow-up assessment was conducted a median of 96 days from the baseline assessment (mean=97.93, SD=18.5). Control participants were offered a place in the intervention after completing the 12-week follow-up. Immediately following each successful follow up assessment, the participants were reimbursed with a Coles-Myer $AU30 voucher via Australian Post for their time and expenses.

**PROJECT CAHL - DATA ANALYSIS**

Analyses were conducted using PASW Statistics 18, Release Version 18.0.0 (SPSS, Inc., 2009, Chicago, IL, [www.spss.com](http://www.spss.com)). The primary measures were: frequency and quantity of cannabis use and percentage days of abstinence (measured by the TLFB<sup>865</sup>); cannabis dependence (measured by the SDS<sup>867</sup>); problems relating to cannabis use (measured by the CPQ<sup>870</sup>); and physical and mental health (measured by the Kessler 10<sup>886</sup> and EQ-5D<sup>872, 873</sup>). The secondary measures included: other substance use (measured by 90 day frequency and the proportion of tobacco to cannabis used when
smoking); demographics (measured using the NMDS-AODTS and a custom SES scale), treatment history (including use of professional help and/or medication in the past 12 months), the confidence scale (based on Stephens et al.’s measure of self-efficacy), the treatment credibility (measured by the adapted CEQ items), and the level of social support (measured by the SSQ-6). Treatment fidelity measures included the participant/counsellor working alliance (measured by the WAI-S) and the purpose built measure of treatment fidelity (the Checklists).

To address the first aim of Project CAHL, to determine if the intervention was delivered as intended, the results from the treatment fidelity measures were described. To further address this first aim, additional two-tailed bivariate correlation analyses were conducted between the primary measures and whether or not the Workbook was utilised during or between sessions, and the number of intervention sessions completed. Finally, analysis of variance testing was conducted to determine if there was any statistically significant relationship between the primary measures and the counsellor delivering the intervention.

To address the second aim of Project CAHL, to determine whether intervention participants show a greater reduction in the primary and secondary measures compared to the control group, an independent structure, linear model, Generalised Estimating Equation (GEE) approach to repeated measures analysis was used to test between-group differences. GEE is appropriate for measuring the relationship between outcome variables and corresponding predictor variables over time. For a within-between interaction model repeated measures multivariate analysis (a close approximation of GEE) a predicted total sample size of 158 participants was required to achieve 80% power at $p<0.05$. Although the treatment effect size regarding changes to cannabis-
related problems was large in a similar face-to-face cannabis intervention \((Cohen’s d=0.78)\), as this intervention found a medium effect size relating to changes in frequency of cannabis use \((Cohen’s d=0.45)\), the present study was powered conservatively based on a medium effect size.

Responses for days of abstinence, cannabis problems, quantity of cannabis, cannabis dependence and alcohol use were not normally distributed. As such, an unstructured working correlation matrix, negative binomial model with log link function was selected as the best fitting model by using the goodness-of-fit statistic. Tobacco use and illicit drug use were dichotomised due to bimodal distribution (every day or other use for tobacco, and any use or no use for illicit drugs) and a binary logistic approach to GEE was used for these variables. Univariate outliers were identified by visual analysis of box plots and multivariate outliers were identified by observation of Mahalanobis Measure distances for each variable in the longitudinal modelling analysis. Univariate and multivariate outliers were noted for quantity of cannabis used. As there was no cause to believe that these cases did not reflect real observations, and because their removal did not change the significance of the regression, results are presented with outliers included. Prior to longitudinal modelling, two-tailed bivariate zero-order correlation analyses were conducted between the included variables and an indicator of the presence of any external cannabis treatment or pharmaceutical medication (dichotomous items recorded at baseline and follow-up assessments). In the case of a statistically significant association, these indicator variables were included into analyses as covariates. In order to correct for variables that differed between participant groups among those who did or did not complete the follow-up assessments, those variables found to differ also were included into all longitudinal modelling as covariates.
As a first step to address the third aim of Project CAHL, to determine whether the improvements made by participants were clinically meaningful and whether intervention participants showed greater improvement compared with control, a definition of meaningful improvement was chosen. For mental health problems, clinically significant improvement is conventionally conceived as movement from a dysfunctional range to a functional range of health.\textsuperscript{479} As there is no specified functional range of cannabis use, Stephens et al.\textsuperscript{160} defined meaningful improvement as a reduction of cannabis use frequency by 50\% from baseline levels to final assessment and no reported cannabis-related problems at final assessment.\textsuperscript{160} Although persons classified as clinically improved by this definition may vary extensively in their cannabis consumption, this definition allows for assessment of clinically meaningful change (an advancement over statistical significance). Stephens et al.'s\textsuperscript{160} definition of improvement was chosen for its stringency compared to alternative definitions (see Chapter Two, p. 93). As a second step to address this aim, between-group comparisons were made using chi-square analysis in order to replicate the analysis conducted by Stephens et al.\textsuperscript{160} For this analysis, a predicted total sample size of 88 participants was required to achieve 80\% power at \( p < 0.05 \) based on the same medium effect size used in the previous power analysis.

To address the fourth aim of Project CAHL, to determine which baseline participant characteristics were associated with variance in cannabis-related treatment outcomes, a series of two-tailed bivariate zero-order correlation analyses were conducted. That is, participant characteristics (demographics, level of social support, years of cannabis use, expectations of treatment, use of medications, stage of change, and motives for cannabis use) were tested for association with changes in cannabis-related treatment outcomes from baseline to four weeks and to 12 weeks. Due to the large number of comparisons
for these analyses (n=18), Bonferroni corrections were made to control for the probability of false positive findings. As such, for these comparisons, an alpha level of $\alpha<0.003$ (based on 0.5/18) was considered statistically significant.

To address the final aim of Project CAHL, to determine whether the intervention promoted a greater reduction in cannabis use compared to control through increasing the participant’s confidence to avoid cannabis use to a greater extent, a mediation analysis was conducted. That is, a series of four regression analyses were conducted. First, the relationship between participant group and days of cannabis use at 12 weeks was regressed. Second, participant group was regressed on confidence to avoid use at four weeks. Third, confidence to avoid use at four weeks was regressed on days of cannabis use at 12 weeks. Finally, the relationship between participant group and days of cannabis use at 12 weeks was regressed adjusting for confidence to avoid cannabis use at four weeks. This analysis was conducted using an SPSS macro developed by Preacher and Hayes, which provides a bootstrapped significance test of the mediation effect. For this analysis, a predicted total sample size of 128 participants was required to achieve 80% power at $p<0.05$ based on the same medium effect size used in the previous power analysis.

Participant drop out in follow-up assessments was tested prior to analysis to determine that the relevant data was missing completely at random (MCAR) using Little’s MCAR test. The SDS data was found not to be MCAR ($p=0.04$); thus, following recommendations by Salim et al., a multiple imputation algorithm (five imputations) was utilised to impute data for this variable by using available cannabis use frequency data to predict missing values, with results presented as pooled output.

This chapter has described the development of the CAHL intervention and the methods
of its evaluation. The results from the described data analysis strategy and a general discussion of the findings of Project CAHL are provided in Chapter Seven.
CHAPTER SEVEN:
PROJECT CAHL RESULTS AND DISCUSSION

OVERVIEW

The development of the Cannabis Assistance Helpline (CAHL) intervention - a four session telephone-based cannabis use intervention - and the methodology to evaluate its efficacy by RCT (referred to as Project CAHL) were presented in the previous chapter. This chapter provides the results from Project CAHL and a discussion of the study findings. First, a series of analyses were conducted to determine if the intervention was delivered as intended. These analyses included observation of treatment adherence, treatment fidelity, and the working alliance formed. Second, the changes relating to the outcome measures of cannabis use frequency and quantity, dependence severity, cannabis-related problems, physical and mental health, and other substance use are described. In addition, differences between those who received the intervention and those who did not (referred to as ‘between-group’ differences) will be presented. Third, the clinical meaningfulness of any improvements made will also be discussed. Fourth, the participant characteristics that are associated with variance in treatment outcomes are discussed and putative mechanisms by which the intervention promoted cannabis use reductions are explored. Finally, the chapter concludes with a summary of results and discussion regarding the utility of the CAHL intervention.
RESULTS

Participant characteristics

The participants’ demographic and substance use profile was assessed in the baseline interview. Information regarding the demographic characteristics of participants by treatment group is presented in Table 7.1. Participants were typically adult males (62.0%), aged in their mid-thirties (range=18-62 years). Approximately half of the participants were in paid employment (52.5%), and most had a tertiary education (51.2%). The majority of those who were employed (n=84; 69.9%) were earning an income greater than $34,000 per year. As determined by the indices of socio-economic status (SES) utilised, the participants typically did not report any socio-economic advantage or disadvantage, relative to the average Australian adult. That is, the mean SES scores were less than one point different from a neutral SES score of 0 (where an SES score of 1 or more, to a maximum of 4, indicates relative advantage and a score of less than -1, to a minimum of -4, indicates relative disadvantage). In addition, participants indicated having moderate satisfaction on average (where a score of 0 indicated the participant was “very dissatisfied” and 5 indicated the participant was “very satisfied”) with the support of two or three caring friends, most of whom did not use cannabis.
Table 7.1 Participant demographic and substance use information at baseline assessment.

<table>
<thead>
<tr>
<th></th>
<th>Control (n=81)</th>
<th>Intervention (n=79)</th>
<th>Total (n=160)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Mean (SD)</td>
<td>%</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
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<tr>
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</tr>
<tr>
<td>Female</td>
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</tr>
<tr>
<td><strong>Age (in years)</strong></td>
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</tr>
<tr>
<td>Age at interview</td>
<td>36.3</td>
<td>(10.4)</td>
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</tr>
<tr>
<td><strong>Income</strong></td>
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<tr>
<td>Full/part time</td>
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<td>51.9</td>
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<tr>
<td>Temporary benefit</td>
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<tr>
<td>Other</td>
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<tr>
<td><strong>Earnings (by income tax bracket)</strong></td>
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<td></td>
</tr>
<tr>
<td>0 - $6,000 per year</td>
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<td>31.6</td>
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<td>$6,001 - $34,000 per year</td>
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<td>$34,001 - $80,000 per year</td>
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<td><strong>Education</strong></td>
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<tr>
<td>Less than year 12</td>
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<td>Year 12 only</td>
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<td>54.4</td>
</tr>
<tr>
<td><strong>Living situation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>23.4</td>
<td></td>
<td>35.5</td>
</tr>
<tr>
<td>With partner</td>
<td>39.5</td>
<td></td>
<td>31.6</td>
</tr>
<tr>
<td>With family</td>
<td>19.7</td>
<td></td>
<td>20.3</td>
</tr>
<tr>
<td>With friends</td>
<td>16.0</td>
<td></td>
<td>7.6</td>
</tr>
<tr>
<td>Other</td>
<td>1.2</td>
<td></td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Socio Economic Scale (SES)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SES (from -4 to +4)</td>
<td>0.5 (2.3)</td>
<td>0.4 (2.6)</td>
<td>0.5 (2.4)</td>
</tr>
<tr>
<td><strong>Social support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of friends</td>
<td>5.3 (4.6)</td>
<td>4.1 (7.3)</td>
<td>4.8 (5.8)</td>
</tr>
<tr>
<td>Percentage of friends that smoke</td>
<td>24.8</td>
<td>32.4</td>
<td>28.5</td>
</tr>
<tr>
<td>Satisfaction with friends (out of 5)</td>
<td>3.5 (1.4)</td>
<td>2.7 (1.9)</td>
<td>3.2 (1.6)</td>
</tr>
</tbody>
</table>

“SES” = Socio-Economic Scale

Note: no significant between-group differences were found at p<0.05 in 2x2 contingency table chi-square testing for sex, income, living situation, and overall ANOVA models for age, earning, SES score, and SSQ score.

Information regarding the participants’ physical and mental health is presented in Table 7.2. The Kessler-10 scale scores indicated that the majority of participants were experiencing high to very high levels of psychological distress (68%). This level of distress was comparably higher than population levels of distress (30% of the general population and 43% of recent cannabis users report high levels of distress). In
addition, according to the EQ-5D scores, the participants most commonly reported quality of life estimates that were below average (a mean health score of 63 out of 100, and quality of life index score of 0.76 out of 1 compared to the normal US-based population estimates of a mean health score of 84 out of 100, and quality of life index score of 0.8 out of 1).  

Table 7.2 Information regarding the health status of participants by participant group

<table>
<thead>
<tr>
<th></th>
<th>Control (n=81)</th>
<th>Intervention (n=79)</th>
<th>Total (n=160)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kessler 10 (level of psychological distress)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>11.3</td>
<td>10.4</td>
<td>10.8</td>
</tr>
<tr>
<td>Moderate</td>
<td>26.3</td>
<td>15.6</td>
<td>21.0</td>
</tr>
<tr>
<td>High</td>
<td>25.0</td>
<td>33.8</td>
<td>29.3</td>
</tr>
<tr>
<td>Very high</td>
<td>37.5</td>
<td>40.3</td>
<td>38.9</td>
</tr>
<tr>
<td>EQ-5D (health related quality of life)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EQ-5D health scale (out of 100)</td>
<td>62.50 (18.0)</td>
<td>64.40 (19.47)</td>
<td>63.44 (18.70)</td>
</tr>
<tr>
<td>EQ-5D quality of life index (from 0 to 1)</td>
<td>0.77 (0.19)</td>
<td>0.75 (0.20)</td>
<td>0.76 (0.20)</td>
</tr>
</tbody>
</table>

Note: no significant differences were found between groups at p<0.05 using overall ANOVA model for Kessler-10 and EQ-5D scores

Information regarding the participants’ cannabis using behaviours is presented in Table 7.3. Participants reported regular cannabis use (defined as ‘at least weekly’) for a median of 15 years (mean=16.2, SD=9.6, range=1-39 years) prior to the baseline interview. In the month prior to baseline interview the participants were using cannabis on a mean of 22.5 days (SD=6.3). The vast majority of participants were contemplating a reduction in their use at the time of baseline interview (90.6% of the total sample).

The most common stage of change reported by participants was ‘action’ indicating that participants were commonly already beginning to make changes to their cannabis use at the time of baseline interview. Notably, the participants reported moderate confidence to avoid cannabis use at the time of baseline interview (mean score of 6.6 out of 10).

Cannabis typically was used by participants to cope with their concerns (82.5% of the
total sample), while enhancement motives (using to get high, because it is fun, or
because it feels good) were the next most common (35.0%), and other motives were less
common (less than 10% of the sample endorsed each of the remaining motives).

Partially as a result of the recruitment and inclusion criteria into Project CAHL, recent
use of illicit drugs other than cannabis was infrequent (four individuals were excluded
due to illicit drug use). The use of alcohol and tobacco was relatively more common
(65% of participants used both at least weekly), and participants usually mixed tobacco
with their cannabis when smoking cones (78.8% of the total sample), such that
approximately one third of the cone was tobacco (31.5% on average).

Table 7.3 Information regarding the health status and substance use behaviours of participants by
participant group

<table>
<thead>
<tr>
<th></th>
<th>Control (n=81)</th>
<th>Intervention (n=79)</th>
<th>Total (n=160)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Mean (SD)</td>
<td>%</td>
</tr>
<tr>
<td><strong>Cannabis history</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at first cannabis use (years)</td>
<td>16.1 (3.8)</td>
<td>15.9 (3.3)</td>
<td>16.0 (3.5)</td>
</tr>
<tr>
<td>Age at first regular use (years)</td>
<td>19.9 (5.8)</td>
<td>19.8 (6.1)</td>
<td>19.8 (5.9)</td>
</tr>
<tr>
<td>28 day cannabis use (days)</td>
<td>22.3 (5.9)</td>
<td>22.6 (6.7)</td>
<td>22.5 (6.3)</td>
</tr>
</tbody>
</table>
| **‘Stage of change’ and confidence to avoid**
| cannabis use                              |               |                     |               |           |               |           |
| Pre-contemplation                          | 13.6          | 5.1                 | 9.4           |
| Contemplation                              | 24.7          | 27.8                | 26.3          |
| Preparation                                | 21.0          | 15.2                | 18.1          |
| Action                                     | 32.1          | 43.0                | 37.5          |
| Maintenance                                | 8.6           | 8.9                 | 8.8           |
| Confidence to avoid use (out of 10)        | 6.5 (2.6)     | 6.6 (2.5)           | 6.6 (2.5)     |
| **Motivation for typical cannabis use**    |               |                     |               |           |               |           |
| Coping motivation                          | 80.2          | 84.8                | 82.5          |
| Enhancement motivation                     | 42.0          | 27.8                | 35.0          |
| Social motivation                          | 2.5           | 3.8                 | 3.1           |
| Expansion motivation                       | 1.2           | 3.8                 | 2.5           |
| Medicinal use motivation                   | 9.9           | 8.9                 | 9.4           |
| **Other substance use**                    |               |                     |               |           |               |           |
| Typically mull tobacco with cannabis       | 80.8          | 76.8                | 78.8          |
| % of tobacco in cannabis cone              | 33.5          | 30.0                | 31.5          |
| Ever used illicit drugs                    | 87.3          | 82.4                | 85.0          |
| 90 day illicit drug use (days)             | 3.2 (2.0)     | 2.9 (2.3)           | 3.1 (2.2)     |
| 90 day tobacco use (days)                  | 58.2 (40.8)   | 59.0 (40.4)         | 58.6 (40.5)   |
| 90 day alcohol use (days)                  | 25.9 (29.4)   | 20.1 (25.6)         | 23.0 (27.6)   |

Note: no significant differences were found between groups at \( p < 0.05 \) in 2x2 contingency table chi-square testing for stage of change, motivation for using, mulling with tobacco, percentage of tobacco in cannabis cone or ever using an illicit drug, and in overall ANOVA model for age of cannabis use, confidence to avoid use, and 90 day substance use
The participants’ cannabis treatment history as reported in the baseline interview is shown in Table 7.4. Previous attempts to reduce cannabis use by both professional help seeking and/or by self-quitting were frequent in the 12 months prior to interview (83.1% of the total sample reported both behaviours). Those participants who reported consulting with a professional (n=150; 93.1%) reported most commonly seeking professional help from a general practitioner (GP; 44% of the total sample). Seeking assistance from a drug or alcohol treatment service was least common (13%). In regards to the CAHL intervention, participants shared strong expectations that the intervention would be credible (the average pooled credibility rating was 8.0 out of 10 [SD=1.6]).

Table 7.4 Cannabis use treatment history and expectations by participant group

<table>
<thead>
<tr>
<th>Treatment history (past year)</th>
<th>Control (n=81) %</th>
<th>Mean (SD)</th>
<th>Intervention (n=79) %</th>
<th>Mean (SD)</th>
<th>Total (n=160) %</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tried to reduce without help</td>
<td>77.8</td>
<td>88.6</td>
<td>83.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulted any professional</td>
<td>91.2</td>
<td>96.2</td>
<td>93.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulted a general practitioner</td>
<td>37.5</td>
<td>50.6</td>
<td>44.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulted a counsellor</td>
<td>18.8</td>
<td>21.5</td>
<td>20.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulted a drug treatment service</td>
<td>6.3</td>
<td>19.0</td>
<td>12.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulted another health professional</td>
<td>21.4</td>
<td>20.3</td>
<td>20.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of consultations</td>
<td>2.3 (5.2)</td>
<td>5.7 (11.1)</td>
<td>4.0 (8.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expectations of treatment (Credibility/Expectancy Questionnaire; CEQ)</th>
<th>Control (n=81) %</th>
<th>Mean (SD)</th>
<th>Intervention (n=79) %</th>
<th>Mean (SD)</th>
<th>Total (n=160) %</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment is logical</td>
<td>7.9 (2.0)</td>
<td>8.2 (1.8)</td>
<td>8.1 (1.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment will be successful</td>
<td>7.7 (1.9)</td>
<td>7.9 (1.8)</td>
<td>7.8 (1.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence in treatment</td>
<td>8.1 (2.2)</td>
<td>7.9 (2.6)</td>
<td>8.0 (2.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: No significant between-group differences were found between the number of intervention and control participants reporting attempts to reduce cannabis use with or without professional help, at p<0.05 in 2x2 contingency table chi-square testing and in overall ANOVA model for the number of consultations, and for expectations of treatment.

No significant group differences were found between intervention and control participants regarding demographics, cannabis and other substance use frequency, cannabis use behaviours, past treatment seeking or in expectations of treatment credibility (all p>0.06).
Use of external treatments and medication

Information regarding the participants’ use of other health professionals and withdrawal medications before and/or during trial participation is presented in Table 7.5. The use of medication (commonly anti-anxiety medication such as Valium or anti-depressants such as Prozac) peaked at four-week follow-up for intervention participants and reduced to a level slightly below baseline at 12 weeks. For control participants a steady increase in the use of medications was observed from baseline to 12-week follow-up. The use of other professional treatment was greater at four-week follow-up for both participant groups compared to 12-week follow-up. A significantly greater number of intervention participants were using medications to assist with cannabis reductions at four weeks compared to control participants ($\chi^2=5.14, OR=0.41$ [95% CI=0.19-0.89], $p=0.023$). No further statistically significant between-group differences in the use of medications or professional help were found. To control for those participants accessing external assistance for reducing cannabis use, two binary variables indicating the presence or absence of medication or additional treatment throughout Project CAHL were included as covariates in the longitudinal analyses as reported.
Table 7.5 Participant use of medications or treatments for cannabis use during Project CAHL

<table>
<thead>
<tr>
<th>Withdrawal medication</th>
<th>Intervention</th>
<th>Control</th>
<th>Between-group comparison</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>% (total ‘n’)</td>
<td>% (total ‘n’)</td>
<td>χ²</td>
<td>p-value</td>
<td>% (total ‘n’)</td>
</tr>
<tr>
<td>Baseline</td>
<td>44.6 (74)</td>
<td>30.7 (75)</td>
<td>3.080</td>
<td>0.079</td>
</tr>
<tr>
<td>Four-week follow-up</td>
<td>54.2 (48)</td>
<td>32.8 (64)</td>
<td>5.136</td>
<td>0.023</td>
</tr>
<tr>
<td>12-week follow-up</td>
<td>37.5 (48)</td>
<td>39.3 (61)</td>
<td>0.039</td>
<td>0.844</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional treatment</th>
<th>Baseline*</th>
<th>0</th>
<th>n/a</th>
<th>n/a</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four-week follow-up</td>
<td>46.3 (54)</td>
<td>51.4 (72)</td>
<td>0.32</td>
<td>0.571</td>
<td>49.2 (126)</td>
</tr>
<tr>
<td>12-week follow-up</td>
<td>44.9 (49)</td>
<td>29.5 (61)</td>
<td>2.781</td>
<td>0.095</td>
<td>36.4 (110)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Either medication or treatment</th>
<th>Baseline</th>
<th>44.6 (74)</th>
<th>30.7 (75)</th>
<th>3.080</th>
<th>0.079</th>
<th>37.6 (149)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four-week follow-up</td>
<td>62.5 (48)</td>
<td>57.8 (64)</td>
<td>0.251</td>
<td>0.617</td>
<td>59.8 (112)</td>
<td></td>
</tr>
<tr>
<td>12-week follow-up</td>
<td>58.3 (48)</td>
<td>52.5 (61)</td>
<td>0.375</td>
<td>0.541</td>
<td>55.0 (109)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Both medication and treatment</th>
<th>Baseline*</th>
<th>0</th>
<th>n/a</th>
<th>n/a</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four-week follow-up</td>
<td>35.4 (48)</td>
<td>20.3 (64)</td>
<td>3.191</td>
<td>0.074</td>
<td>26.8 (112)</td>
</tr>
<tr>
<td>12-week follow-up</td>
<td>25.0 (48)</td>
<td>16.4 (61)</td>
<td>1.235</td>
<td>0.266</td>
<td>20.2 (109)</td>
</tr>
</tbody>
</table>

* Inclusion criteria prevented participants from recent access (past three months) of other cannabis use treatments

**Aim one: Intervention delivery**

*Treatment fidelity*

To describe the treatment fidelity, the counsellors were asked to rate how successfully they felt the individual components of each session were delivered on a 1-5 Likert-type scale using the *Checklist* (see Appendix C [p.77 of the treatment manual]). The counsellors provided fidelity ratings for 61 of 68 sessions (89.7% of sessions), but did not have the required paperwork to give fidelity ratings at the time of the session for the seven missing sessions. In addition to these counsellor treatment fidelity ratings, the candidate also provided treatment fidelity ratings by listening to the counsellors deliver approximately one fifth of the total number of sessions (n=37; 16.7% of all sessions;
25.0% of first sessions, 14.0% of second sessions, 11.8% of third sessions, and 13.3% of the fourth sessions). The components of each session, along with the fidelity ratings (out of 5) by the counsellors and the candidate, and the frequency to which these ratings matched, are depicted in Tables 7.6 through to 7.9.

In addition, these tables show whether the participant had the *Workbook* with them at the time of the phone call and whether or not the participant completed the self-help exercises contained within the *Workbook* between the sessions. Two-tailed correlation testing was used between these two variables and the primary and secondary treatment outcomes at the four- and 12-week assessments to determine whether use of the workbook was associated with the outcomes. Results from these analyses are presented in the table notes.
Table 7.6 Clinician and candidate checklist ratings for session one with correlation analysis

<table>
<thead>
<tr>
<th>Session one component ratings (out of 5)</th>
<th>Counsellor rating M (SD) n=77</th>
<th>Candidate rating M (SD) n=17</th>
<th>Per cent agreement % (n=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce yourself and establish rapport*</td>
<td>4.4 (0.7)</td>
<td>4.1 (1.1)</td>
<td>23.1</td>
</tr>
<tr>
<td>Review the main points from the consent form</td>
<td>4.6 (0.6)</td>
<td>4.9 (0.3)</td>
<td>38.5</td>
</tr>
<tr>
<td>Introduce <em>Workbook</em></td>
<td>4.2 (0.8)</td>
<td>3.5 (1.0)</td>
<td>53.8</td>
</tr>
<tr>
<td>Explored the participant’s problem situation</td>
<td>4.7 (0.6)</td>
<td>4.9 (0.3)</td>
<td>38.5</td>
</tr>
<tr>
<td>Introduce the CAHL model</td>
<td>4.3 (0.8)</td>
<td>3.6 (0.8)</td>
<td>30.8</td>
</tr>
<tr>
<td>Review the PFR : SDS score</td>
<td>4.4(0.7)</td>
<td>4.3 (0.7)</td>
<td>61.5</td>
</tr>
<tr>
<td>Review the PFR: Costs of using cannabis</td>
<td>4.3 (0.9)</td>
<td>4.3 (1.0)</td>
<td>38.5</td>
</tr>
<tr>
<td>Educate regarding Cannabis withdrawals</td>
<td>4.3 (0.8)</td>
<td>4.6 (0.8)</td>
<td>61.5</td>
</tr>
<tr>
<td>Provided any needed information</td>
<td>4.0 (1.2)</td>
<td>4.3 (0.9)</td>
<td>30.8</td>
</tr>
<tr>
<td>Make a change date &amp; organise future sessions</td>
<td>4.6 (0.9)</td>
<td>3.9 (1.1)</td>
<td>53.8</td>
</tr>
<tr>
<td>Schedule reduction in cannabis use</td>
<td>3.9 (1.4)</td>
<td>3.2 (1.5)</td>
<td>46.2</td>
</tr>
<tr>
<td>Self-help exercises (Workbook Section 2&amp;4)</td>
<td>4.5 (0.9)</td>
<td>4.2 (1.3)</td>
<td>30.8</td>
</tr>
<tr>
<td>Self-help exercises (Self monitoring diary)</td>
<td>4.6 (0.8)</td>
<td>4.0 (1.4)</td>
<td>46.2</td>
</tr>
<tr>
<td>Wrap up</td>
<td>4.7 (0.6)</td>
<td>4.3 (1.3)</td>
<td>30.8</td>
</tr>
<tr>
<td>TOTAL (out of 70)</td>
<td>61.5 (6.0)</td>
<td>58.1 (6.5)</td>
<td>41.8</td>
</tr>
</tbody>
</table>

Had the workbook handy? (% yes) * 63.6% n/a n/a

a: whether or not the workbook was present during session one correlated significantly with: 1) mean Kessler 10 scores at four weeks (r=0.287, p=0.037; a mean Kessler 10 score of 17.9 [SD=8.3] for those who had the workbook present compared to 23.6 [SD=9.8] for those who did not have the workbook present) and at 12 weeks (r=0.353, p=0.014; 16.3 [SD=6.1] compared to 21.7 [SD=7.9]), 2) the mean EQ5D physical health scale score at four weeks (r=0.322, p=0.019; a scale score of 77.6 [SD=12.9] compared to 65.0 [SD=24.8], respectively) and at 12 weeks (r=0.425, p=0.003; 78.7 [SD=12.0] compared to 65.0 [SD=17.2], respectively), and 3) the mean EQ-5D index at four weeks (r=0.568, p<0.001; 0.9 [SD=0.1] compared to 0.7 [SD=0.2], respectively) and at 12 weeks (r=0.354, p=0.014; 0.9 [SD=0.1] compared to 0.8 [SD=0.2], respectively)
### Table 7.7 Clinician and candidate checklist ratings for session two with correlation analysis

<table>
<thead>
<tr>
<th>Session two component ratings (out of 5)</th>
<th>Counsellor rating (M (SD), n=60)</th>
<th>Fidelity rating (M (SD), n=8)</th>
<th>Per cent agreement % (n=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconnect with the participant</td>
<td>4.7 (0.6)</td>
<td>4.7 (0.4)</td>
<td>0</td>
</tr>
<tr>
<td>Discuss self-help exercises and previous session</td>
<td>4.3 (0.8)</td>
<td>3.9 (0.7)</td>
<td>0</td>
</tr>
<tr>
<td>EITHER: Attend to participants who successfully reduced…</td>
<td>4.7 (0.5)</td>
<td>4.6 (0.8)</td>
<td>100</td>
</tr>
<tr>
<td>OR: Attend to participants who were unable to reduce</td>
<td>4.1 (0.7)</td>
<td>#</td>
<td>#</td>
</tr>
<tr>
<td>List triggers and cues to cannabis use</td>
<td>4.4 (0.7)</td>
<td>3.9 (1.0)</td>
<td>66.7</td>
</tr>
<tr>
<td>Decisional balance</td>
<td>4.3 (1.1)</td>
<td>4.0 (0.8)</td>
<td>66.7</td>
</tr>
<tr>
<td>Self-help exercises - Act out a benefit of abstinence</td>
<td>4.1 (1.0)</td>
<td>3.6 (1.6)</td>
<td>33.3</td>
</tr>
<tr>
<td>Self-help exercises – Workbook Section 3</td>
<td>4.1 (0.8)</td>
<td>3.3 (1.3)</td>
<td>33.3</td>
</tr>
<tr>
<td>Self-help exercises – Identify ineffective strategies</td>
<td>3.8 (1.1)</td>
<td>3.7 (1.7)</td>
<td>33.3</td>
</tr>
<tr>
<td>Wrap up</td>
<td>4.7 (0.7)</td>
<td>4.0 (1.4)</td>
<td>33.3</td>
</tr>
<tr>
<td>TOTAL (out of 45) – for those able to reduce</td>
<td>38.9 (4.9)</td>
<td>36.4 (8.0)</td>
<td>33.3</td>
</tr>
<tr>
<td>TOTAL (out of 45) – for those unable to reduce</td>
<td>37.1 (7.8)</td>
<td>#</td>
<td>n/a</td>
</tr>
<tr>
<td>Had the workbook handy? (% yes) a</td>
<td>88.9%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Used the workbook between sessions? (% yes) b</td>
<td>70.5%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

# no ratings were given for this component as no participants receiving ratings by the candidate were unable to reduce

**a:** whether or not the workbook was present during session two correlated significantly with mean abstinent days at four-week assessment ($r = 0.3, p = 0.035$; a mean of 20.1 [SD=10.4] days for those who had the workbook present compared to 8.3 [SD=11.3] for those who did not have the workbook present)

**b:** whether or not the session exercises following session one were completed correlated significantly with mean cannabis dependence scores at 12-week assessment ($r = 0.3, p = 0.032$; a mean dependence score of 2.7 [SD=3.3] for those who completed the exercises compared to 6.1 [SD=5.4] who did not complete the exercises) and confidence to avoid use at four weeks ($r = 0.355, p = 0.017$; a mean confidence score of 8.7 [SD=1.5] compared to 6.9 [SD=3.4], respectively)
### Table 7.8 Clinician and candidate checklist ratings for session three with correlation analysis

<table>
<thead>
<tr>
<th>Session three component ratings (out of 5)</th>
<th>Counsellor rating M (SD) n=45</th>
<th>Fidelity rating M (SD) n=6</th>
<th>Per cent agreement % (n=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconnect with the participant</td>
<td>4.7 (0.6)</td>
<td>4.7 (0.4)</td>
<td>33.3</td>
</tr>
<tr>
<td>Discuss self-help exercises and previous session</td>
<td>4.3 (0.9)</td>
<td>4.6 (0.6)</td>
<td>33.3</td>
</tr>
<tr>
<td>EITHER: Attend to participants who successfully reduced…</td>
<td>4.6 (0.8)</td>
<td>4.9 (0.4)</td>
<td>100.0</td>
</tr>
<tr>
<td>OR: Attend to participants who were unable to reduce</td>
<td>3.6 (0.8)</td>
<td>4.4 (0.9)</td>
<td>0.0</td>
</tr>
<tr>
<td>Discuss high risk situations and emergency plans</td>
<td>4.2 (0.8)</td>
<td>4.6 (0.9)</td>
<td>33.3</td>
</tr>
<tr>
<td>High risk situation strategies – Distraction</td>
<td>4.4 (0.9)</td>
<td>4.4 (0.7)</td>
<td>33.3</td>
</tr>
<tr>
<td>High risk situation strategies – Delaying</td>
<td>4.5 (0.9)</td>
<td>4.2 (0.8)</td>
<td>33.3</td>
</tr>
<tr>
<td>High risk situation strategies – Decatastrophising</td>
<td>4.2 (1.0)</td>
<td>4.1 (1.1)</td>
<td>66.7</td>
</tr>
<tr>
<td>Discuss high risk situation strategies – De-stressing</td>
<td>4.4 (0.9)</td>
<td>4.4 (1.1)</td>
<td>33.3</td>
</tr>
<tr>
<td>Discuss high risk situation strategies – Staying healthy</td>
<td>4.3 (1.0)</td>
<td>4.2 (1.3)</td>
<td>66.7</td>
</tr>
<tr>
<td>Owning your actions</td>
<td>4.1 (1.0)</td>
<td>3.7 (1.2)</td>
<td>33.3</td>
</tr>
<tr>
<td>Self-help exercises - Creating a list of rewarding activities</td>
<td>3.9 (1.1)</td>
<td>4.50 (1.1)</td>
<td>66.7</td>
</tr>
<tr>
<td>Self-help exercises - Workbook Section 5</td>
<td>4.2 (1.0)</td>
<td>3.6 (1.3)</td>
<td>100.0</td>
</tr>
<tr>
<td>Wrap up</td>
<td>4.6 (0.9)</td>
<td>4.4 (0.7)</td>
<td>66.7</td>
</tr>
<tr>
<td>TOTAL (out of 65) – for those able to reduce</td>
<td>55.8(7.9)</td>
<td>57.0(8.2)</td>
<td>33.3</td>
</tr>
<tr>
<td>TOTAL (out of 65) – for those unable to reduce</td>
<td>54.5(6.9)</td>
<td>53.5(2.1)</td>
<td>0.0</td>
</tr>
<tr>
<td>Had the workbook handy? (% yes) ^</td>
<td>85.4%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Used the workbook between sessions? (% yes) ^</td>
<td>82.5%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

^ the number of matching cases was too low for a Kappa coefficient to be calculated

a: whether or not the workbook was present during session three did not correlate significantly with any treatment outcome (all p>0.2)

b: whether or not the session exercises following session two were completed did not correlate significantly with any treatment outcome (all p>0.2)
### Table 7.9 Clinician and candidate checklist ratings for session four with correlation analysis

<table>
<thead>
<tr>
<th>Session four component ratings (out of 5)</th>
<th>Counsellor rating M (SD)</th>
<th>Fidelity rating M (SD)</th>
<th>Per cent agreement % (n=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconnect with the participant</td>
<td>4.8 (0.6)</td>
<td>4.5 (0.6)</td>
<td>66.7</td>
</tr>
<tr>
<td>Discuss self-help exercises and past sessions</td>
<td>4.3 (0.9)</td>
<td>4.2 (0.8)</td>
<td>33.3</td>
</tr>
<tr>
<td>EITHER: Attend to participants who successfully reduced…</td>
<td>4.8 (0.8)</td>
<td>5.0 (0.0)</td>
<td>100.0</td>
</tr>
<tr>
<td>OR: Attend to participants who were unable to reduce</td>
<td>4.2 (0.7)</td>
<td>3.5 (0.0)</td>
<td>0.0</td>
</tr>
<tr>
<td>Relapse prevention techniques: Rationalising</td>
<td>4.5 (0.8)</td>
<td>4.5 (0.8)</td>
<td>33.3</td>
</tr>
<tr>
<td>Relapse prevention techniques: Preparing for loss</td>
<td>4.1 (0.9)</td>
<td>4.5 (0.8)</td>
<td>0.0</td>
</tr>
<tr>
<td>Relapse prevention techniques: Self-monitoring</td>
<td>4.1 (1.0)</td>
<td>4.7 (0.5)</td>
<td>0.0</td>
</tr>
<tr>
<td>Relapse prevention techniques: Self rewards</td>
<td>4.5 (0.8)</td>
<td>4.5 (0.6)</td>
<td>33.3</td>
</tr>
<tr>
<td>Encourage self-efficacy in the participant</td>
<td>4.4 (0.9)</td>
<td>4.7 (0.5)</td>
<td>33.3</td>
</tr>
<tr>
<td>Identify participant’s social support network</td>
<td>4.6 (0.9)</td>
<td>4.0 (0.6)</td>
<td>33.3</td>
</tr>
<tr>
<td>Bolster participant’s problem solving skills</td>
<td>4.0 (1.2)</td>
<td>4.3 (0.9)</td>
<td>33.3</td>
</tr>
<tr>
<td>Offer referrals to additional treatment</td>
<td>3.8 (1.5)</td>
<td>4.6 (0.9)</td>
<td>0.0</td>
</tr>
<tr>
<td>Field last questions and inform about follow-up</td>
<td>4.3 (1.2)</td>
<td>3.8 (1.3)</td>
<td>0.0</td>
</tr>
<tr>
<td>TOTAL (out of 60) – for those able to reduce</td>
<td>52.2 (7.2)</td>
<td>52.6 (3.2)</td>
<td>0.0</td>
</tr>
<tr>
<td>TOTAL (out of 60) – for those unable to reduce</td>
<td>51.6 (4.4)</td>
<td>52.0 (0.0)</td>
<td>0.0</td>
</tr>
<tr>
<td>Had the workbook handy? (% yes) a</td>
<td>86.1%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Used the workbook between sessions? (% yes) b</td>
<td>88.9%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

a: whether or not the workbook was present during session four did not correlate significantly with any treatment outcome (all $p>0.1$)

b: whether or not the session exercises following session three were completed correlated significantly with mean quantity used on a typical day of smoking at four weeks ($r=0.407$, $p=0.008$; a quantity of 1.7 [SD=3.2] for those who completed the exercises compared to 7.5 [SD=8.9] for those who did not complete the exercises)

The counsellor ratings on each individual item ranged from a mean of 3.89 (SD=0.49) in the second session to 4.35 (SD=0.60), 4.39 (SD=0.43), and 4.49 (SD=0.49) in the fourth, first and third session, respectively. The candidate ratings on each individual item ranged from a mean of 4.05 (SD=0.88) in the second session, to 4.38 (SD=0.26), 4.13 (SD=0.47), and 4.38 (SD=0.63) in the fourth, first and third session, respectively.

Notably, the candidate fidelity ratings did not statistically significantly vary depending on which counsellor was delivering the session (all $p>0.06$), which indicated that all counsellors were able to deliver the sessions effectively.

Unfortunately, few intervention sessions were rated by both the counsellor and the
candidate (13 matching occasions in the first session, and three matching occasions in sessions two, three, and four). Although the frequency to which the same individual item rating (out of 5) was given by the counsellor and candidate was low, it was uncommon for these ratings to differ by more than one unit (15.5% of item ratings). This was reflected by the similarity in the grand total fidelity ratings. These total ratings differed by a range of 0.38 units in the fourth session to 3.34 units in the first session, and no significant differences were found between the total fidelity ratings as reported by the counsellor and candidate (all \( p > 0.18 \)).

In summary, the fidelity ratings given by both the CIH counsellors and the candidate indicated that the four CAHL intervention sessions were each delivered as intended with scores below four out of five rarely reported. It appeared that the lower scores were associated with the session components relating to the use of the *Workbook* (that is, organising self-help tasks between sessions). Notably, use of the *Workbook* during the first two intervention sessions appeared to be important in predicting greater improvements compared to not having the *Workbook* during sessions and not completing *Workbook* homework in mental health outcomes at both follow-up assessments, and greater cannabis use reductions in the four-week assessment, and cannabis dependence severity in the 12-week assessment.

*Treatment and trial adherence*

To address part two of this first aim, to describe participant adherence to treatment, the number of participants completing each counselling session was noted. A small group \((n=11; \, 14\%)\) of participants who were randomised into the intervention condition were not contactable by the counsellors thereafter, leaving 68 treatment initiators. Table 7.10 depicts the results from an analysis conducted to determine if there was a statistically
significant difference between the intervention participants who completed at least one session and those who chose not to complete any sessions on all baseline measures of demographics and cannabis use related variables. As shown, intervention participants who did not complete any counselling sessions were statistically significantly more likely to be male, younger in age, less likely to have made a recent unassisted attempt at reducing use, and used cannabis on significantly more days in the 28 days prior to baseline interview compared to participants who completed at least one session.

Table 7.10 Significant indicators of intervention participants who chose to begin the first intervention session or not

<table>
<thead>
<tr>
<th>Test variable</th>
<th>Statistical test results</th>
<th>Significance (p-value)</th>
<th>Treatment initiators (n=68)</th>
<th>Did not initiate treatment (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>$\chi^2=4.53, OR=7.46 (95% CI=0.90-62.5)$</td>
<td>0.033</td>
<td>57.4% (male)</td>
<td>90.9% (male)</td>
</tr>
<tr>
<td>Age (in years)</td>
<td>$F_{1,77}=11.48$</td>
<td>0.001</td>
<td>37.15 (9.63)</td>
<td>27.00 (5.75)</td>
</tr>
<tr>
<td>Self-quit attempt (y/n)</td>
<td>$\chi^2=7.89, OR=7.20 (95% CI=1.56-33.22)$</td>
<td>0.005</td>
<td>92.6%</td>
<td>63.6%</td>
</tr>
<tr>
<td>Days without cannabis</td>
<td>$F_{1,78}=4.19$</td>
<td>0.040</td>
<td>6.00 (7.00)</td>
<td>1.64 (1.86)</td>
</tr>
</tbody>
</table>

No baseline characteristics significantly predicted treatment completion among those intervention participants who attended at least one session (all $p>0.05$). Compared to those who did not complete all four sessions ($n=34$), however, those who completed the four intervention sessions ($n=45$) were significantly more likely to complete the four-week follow-up (95.6% compared to 32.4%; $\chi^2=35.8$, $p<0.001$) and 12-week assessments (84.4% compared to 32.4%; $\chi^2=22.3$, $p<0.001$).

Overall, 21% of participants ($n=34$) did not complete the four-week follow-up interview, and 31.3% ($n=50$) did not complete the 12-week follow-up interview. Compared with those who completed the four-week follow-up assessment, participants
who did not complete the follow-up reported significantly higher baseline rates of cannabis dependence ($F_{1,158}=1.6, p=0.045$), and problems related to cannabis use ($F_{1,158}=6.5, p=0.012$), and were significantly younger ($F_{1,158}=8.21, p=0.005$). In addition, compared to the intervention group, the control group was significantly more likely to have completed the interim four-week follow-up interview (89% compared to 68%; $\chi^2=10.1, p=0.002$). No significant differences were found at the 12-week follow-up (all $p>0.06$).

A two-tailed correlation analysis was conducted to determine if there was a statistically significant association between the number of counselling sessions attended by intervention participants and treatment outcomes at the four- and 12-week assessments. No significant associations were found in this regard (all $p>0.09$). Further post-hoc testing was conducted to determine if there were any associations between complete or partial treatment adherence and treatment outcomes. To do so, a dichotomous variable representing complete or partial treatment adherence was created. Unfortunately, relatively few participants who partially completed the intervention went on to complete the follow-up assessments compared to those who completed the intervention (32.4% compared to 95.6% at four weeks, and 32.4% compared to 84.4% at 12 weeks, respectively). Consequently, even with this dichotomous variable, the analysis was under-powered due to a small sample size (assuming a small effect size this analysis achieved 54.6% power) and no significant associations were detected (all $p>0.09$). There was an evident trend, however, for treatment completers to report greater reductions to cannabis and other substance use (particularly alcohol and tobacco use) at four and 12 weeks. Information regarding this analysis is presented in Table 7.11.

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vi These factors were included as covariates in all longitudinal modelling in order to control for the variance in the number of participants completing follow-up assessments and those lost to follow-up.
Working Alliance

The majority of intervention participants completed at least one counselling session and reported on the working alliance formed therein ($n=47; 69\%$). These participants reported a mean WAI-S score of 76.3 ($\text{median}=80, SD=9.9, \text{range}=40-84$), with one in five participants (21\%) reporting the highest possible score of 84. No significant differences were found between counsellors and the participants’ ratings of working alliance ($p=0.134$). The counsellors also provided a WAI-S score for the majority of intervention participants after completing intervention delivery ($n=56; 71\%$). The counsellors reported a mean alliance score of 72.7 ($\text{median}=79, SD=12.1, \text{range}=36-84$), although the highest possible score was given in only 5.4\% of cases. No significant difference was noted between the counsellor and participant ratings of working alliance ($p=0.102$). The relationship between the alliance scores (as reported by the participants and counsellors) and treatment outcome measures at four and 12 weeks was tested. Greater alliance scores as reported by participants but not counsellors were found to correlate with a greater number of abstinent days at 12 weeks ($r=0.36, p=0.023$). No other significant relationships between the participants’ or counsellors’ alliance scores and treatment outcomes at four or 12 weeks were noted (all $p>0.06$).
Table 7.11 Treatment outcomes at four- and 12-week follow-up assessments depicted by rates of treatment retention

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>1-3 sessions (n=11)</th>
<th>Four sessions (n=42)</th>
<th>Control (n=81)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Four-week Assessment Mean (SD)</td>
<td>12-week Assessment Mean (SD)</td>
<td>Four-week Assessment Mean (SD)</td>
</tr>
<tr>
<td>Percentage of abstinent days (28-day)</td>
<td>66.2 (38.1)</td>
<td>74.6 (39.9)</td>
<td>70.6 (38.4)</td>
</tr>
<tr>
<td>Hours spent ‘high’ per day</td>
<td>3.0 (3.4)</td>
<td>3.6 (5.3)</td>
<td>2.4 (4.9)</td>
</tr>
<tr>
<td>Quantity of cannabis on typical day</td>
<td>7.5 (15.3)</td>
<td>5.1 (11.1)</td>
<td>4.9 (14.1)</td>
</tr>
<tr>
<td>Cannabis problems</td>
<td>4.5 (4.2)</td>
<td>3.6 (4.4)</td>
<td>3.4 (3.7)</td>
</tr>
<tr>
<td>Cannabis dependence</td>
<td>5.3 (4.3)</td>
<td>4.0 (5.0)</td>
<td>3.7 (3.6)</td>
</tr>
<tr>
<td>Percentage reporting ‘meaningful’ change</td>
<td>9.1</td>
<td>36.4</td>
<td>25.6</td>
</tr>
<tr>
<td>90-day tobacco use frequency</td>
<td>63.8 (41.0)</td>
<td>73.6 (36.4)</td>
<td>17.0 (23.9)</td>
</tr>
<tr>
<td>90-day alcohol use Frequency</td>
<td>15.3 (24.9)</td>
<td>9.5 (20.4)</td>
<td>0.4 (1.4)</td>
</tr>
<tr>
<td>90-day illicit drug use frequency</td>
<td>0.0 (0)</td>
<td>0.0 (0)</td>
<td>0.4 (1.4)</td>
</tr>
<tr>
<td>Percentage of tobacco in cones</td>
<td>25.0 (25.4)</td>
<td>22.4 (25.0)</td>
<td>13.7 (21.0)</td>
</tr>
<tr>
<td>K-10</td>
<td>17.8 (4.8)</td>
<td>17.8 (6.4)</td>
<td>20.3 (9.8)</td>
</tr>
<tr>
<td>EQ5D Index</td>
<td>0.9 (0.1)</td>
<td>0.9 (0.2)</td>
<td>0.9 (0.2)</td>
</tr>
<tr>
<td>EQ5D Scale</td>
<td>79.6 (14.3)</td>
<td>75.7 (11.3)</td>
<td>71.4 (19.4)</td>
</tr>
</tbody>
</table>

"K-10"=Kessler-10 scale of psychological distress, “EQ5D”=EuroQol 5-dimension (health related quality of life index and physical health scale)
Effect of counsellor

Using the intervention participant data, each of the primary and secondary treatment outcome variables at four and 12 weeks were compared to determine whether or not there were any statistically significant differences in outcomes between the four counsellors who delivered the intervention. At the four-week follow-up, the EQ5D index score was found to significantly vary depending on the counsellor to whom the participant was assigned \( (F_{3,47}=2.96, p=0.042) \). No further treatment outcomes at four- or 12-week follow-up were found to be significantly associated with the variations in counsellor delivering the intervention (all \( p>0.1 \)). The EQ5D index score reported by participants ranged from 0.77 (SD=0.23, median=0.84), to 0.87 (SD=0.22, median=1.0), 0.89 (SD=0.13, median=0.84), and 0.93 (SD=0.08, median=1.0) between counsellors.

**Aim two: Group differences in treatment outcomes**

To address the second aim of describing the between-group differences in treatment outcomes, the intervention and control participants’ baseline and four- and 12-week follow-up assessment outcome scores were noted. As shown in Table 7.12, both participant groups showed statistically significant improvements between the baseline and the four-week and 12-week follow-up interviews on measures of cannabis use frequency and quantity, confidence to avoid cannabis use, severity of cannabis dependence, cannabis use related problems, and the measures of psychological functioning (all \( p<0.001 \)). In addition, Table 7.12 depicts a non-significant tendency to reduce use of tobacco, alcohol, and other illicit substances among both groups. A single exception was that the reductions reported by intervention participants regarding the
percentage of tobacco mixed with cannabis cones reached significance at four weeks and this difference was maintained at 12 weeks. This was not the case for control participants who reported a non-significant trend in reducing this percentage. Finally, Table 7.12 also presents the intervention effect size at each follow-up assessment calculated from the mean change scores from baseline.

A total of 20% of participants reported abstinence from cannabis at both the four- and 12-week follow-up assessments (referred to as ‘continuous abstinence’). No significant between-group differences regarding the proportion of participants reporting continuous abstinence were noted ($p=0.125$; 26.5% of intervention participants and 14.8% of control participants).

At baseline according to the SDS measure, all participants were likely to be dependent on cannabis (a score greater than 3 was indicative of dependence). At four weeks this figure was reduced to 50.0% of the intervention participants and 86.1% of control participants. At 12 weeks this figure reduced again to 44.9% and 72.1%, respectively. The reduction in the number of participants meeting criteria indicative of cannabis dependence was greater for the intervention group compared to control at four and 12 weeks ($\chi^2=19.4, p<0.001$; and $\chi^2=8.4, p=0.004$, respectively).
Table 7.12 Treatment outcomes at baseline, four-week and 12-week follow up assessments, by participant group

<table>
<thead>
<tr>
<th></th>
<th>Control Baseline^</th>
<th>Intervention Baseline^</th>
<th>Control Four-week FU</th>
<th>Intervention Four-week FU</th>
<th>Intervention effect size Four-week FU d (95% CI)</th>
<th>Control 12-week FU</th>
<th>Intervention 12-week FU</th>
<th>Intervention effect size 12-week FU d (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td><strong>Cannabis use, frequency, and quantity outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28-day cannabis use frequency</td>
<td>22.3 (5.9)</td>
<td>22.6 (6.7)</td>
<td>13.4 (11.2)</td>
<td>8.5 (10.7)</td>
<td>0.6 (0.3-0.9)</td>
<td>12.5 (11.4)</td>
<td>7.3 (10.3)</td>
<td>0.6 (0.2-1.1)</td>
</tr>
<tr>
<td>Per day quantity (# of cones)</td>
<td>14.2 (10.9)</td>
<td>15.6 (12.1)</td>
<td>6.5 (9.5)</td>
<td>3.4 (8.0)</td>
<td>0.4 (0.1-0.7)</td>
<td>6.7 (10.4)</td>
<td>5.0 (13.3)</td>
<td>0.4 (0.0-0.8)</td>
</tr>
<tr>
<td>Time spent ‘high’</td>
<td>13.5 (8.9)</td>
<td>12.3 (7.9)</td>
<td>6.0 (6.3)</td>
<td>2.1 (4.8)</td>
<td>0.4 (0.1-0.7)</td>
<td>5.8 (6.9)</td>
<td>2.1 (4.4)</td>
<td>0.3 (0.0-0.6)</td>
</tr>
<tr>
<td>Percentage of abstinent days (past 28 days)</td>
<td>20.3 (20.9)</td>
<td>19.3 (23.9)</td>
<td>51.9 (40.3)</td>
<td>69.5 (38.0)</td>
<td>0.6 (0.3-0.9)</td>
<td>55.3 (40.7)</td>
<td>73.3 (36.8)</td>
<td>0.6 (0.2-1.1)</td>
</tr>
<tr>
<td><strong>Cannabis-related problems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannabis problems (out of 22)</td>
<td>10.4 (4.6)</td>
<td>11.2 (4.7)</td>
<td>6.5 (4.7)</td>
<td>3.6 (3.8)</td>
<td>0.8 (0.4-1.2)</td>
<td>5.3 (4.5)</td>
<td>3.6 (4.4)</td>
<td>0.5 (0.1-0.9)</td>
</tr>
<tr>
<td>Cannabis dependence (out of 15)</td>
<td>9.7 (3.6)</td>
<td>10.4 (3.0)</td>
<td>7.1 (3.8)</td>
<td>4.2 (4.2)</td>
<td>1.0 (0.6-1.4)</td>
<td>5.8 (4.3)</td>
<td>3.2 (3.8)</td>
<td>0.9 (0.5-1.3)</td>
</tr>
<tr>
<td><strong>Other substance use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90-day tobacco use frequency</td>
<td>59.0 (40.4)</td>
<td>57.6 (41.7)</td>
<td>46.7 (43.4)</td>
<td>46.4 (43.6)</td>
<td>0.0 (-0.3-0.3)</td>
<td>54.7 (41.6)</td>
<td>55.1 (41.4)</td>
<td>0.0 (-0.3-0.4)</td>
</tr>
<tr>
<td>90-day alcohol use frequency</td>
<td>25.9 (29.4)</td>
<td>20.1 (25.6)</td>
<td>23.6 (27.5)</td>
<td>16.7 (23.9)</td>
<td>0.0 (-0.3-0.4)</td>
<td>29.6 (29.5)</td>
<td>17.1 (23.3)</td>
<td>0.2 (-0.1-0.6)</td>
</tr>
<tr>
<td>90-day illicit drug use frequency</td>
<td>1.4 (8.6)</td>
<td>0.6 (2.9)</td>
<td>0.9 (4.4)</td>
<td>0.2 (1.1)</td>
<td>0.0 (-0.3-0.3)</td>
<td>0.7 (4.8)</td>
<td>0.1 (0.7)</td>
<td>0.0 (-0.3-0.4)</td>
</tr>
<tr>
<td>% of tobacco in cannabis cone</td>
<td>32.4 (22.8)</td>
<td>26.5 (22.7)</td>
<td>31.3 (24.6)</td>
<td>15.3 (21.8)</td>
<td>0.4 (0.1-0.8)</td>
<td>30.6 (25.5)</td>
<td>15.8 (24.6)</td>
<td>0.4 (0.1-0.7)</td>
</tr>
<tr>
<td><strong>Psychological functioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K-10 (out of 50)</td>
<td>26.8 (14.2)</td>
<td>26.5 (9.0)</td>
<td>21.4 (8.7)</td>
<td>19.5 (8.6)</td>
<td>0.2 (-0.2-0.5)</td>
<td>20.3 (8.0)</td>
<td>18.2 (7.2)</td>
<td>0.2 (0.1-0.5)</td>
</tr>
<tr>
<td>EQ5D Index score (range 0-1)</td>
<td>0.8 (0.2)</td>
<td>0.7 (0.2)</td>
<td>0.8 (0.2)</td>
<td>0.9 (0.2)</td>
<td>0.2 (-0.1-0.5)</td>
<td>0.8 (0.2)</td>
<td>0.9 (0.2)</td>
<td>0.2 (-0.1-0.5)</td>
</tr>
<tr>
<td>EQ5D Physical health scale (out of 100)</td>
<td>63.9 (16.9)</td>
<td>64.2 (18.0)</td>
<td>70.2 (18.3)</td>
<td>74.4 (16.6)</td>
<td>0.2 (-0.1-0.5)</td>
<td>69.9 (19.2)</td>
<td>75.3 (14.8)</td>
<td>0.3 (-0.0-0.6)</td>
</tr>
</tbody>
</table>

^FU"=Follow-up, "d"=Cohen’s d, “CI”=Confidence Interval, “K-10”=Kessler-10 scale, “EQ5D”=EuroQol 5-dimension scale

# Reductions shown in other substance use outcomes were not found to be significant from baseline to four-week or 12-week follow-up for either participant group

^ No significant between-group differences were found between the control and intervention participants among these baseline variables (all p>0.1)
Longitudinal modelling of treatment outcomes

The dataset was tested prior to each longitudinal analysis to determine that data was missing completely at random (MCAR) using Little’s MCAR test.\(^{891}\) For each MCAR test, only the variables included in the associated analysis were included. The results indicated that analysis including SDS data was found not to be MCAR \((p=0.014)\); thus, following recommendations by Salim et al.,\(^{892}\) a multiple imputation algorithm (five imputations) was utilised to impute data by using available cannabis use frequency data to predict missing values, with analysis results presented as pooled output (the mean obtained from the five imputations). Results from the longitudinal analyses are presented in Table 7.13.

As hypothesised, the Treatment by Time interactions between the hours spent ‘high’ from cannabis use on a typical day, cannabis use related problems, and severity of dependence were statistically significant (see Table 7.13). This indicated that, at four and 12 weeks, compared to the control group, intervention participants reported a greater reduction in cannabis-related problems and cannabis dependence severity, as well as in the number of hours spent high per day of use. Contrary to hypotheses, the overall Treatment by Time interaction regarding reductions in cannabis frequency or quantity, and/or other substance use frequency, and regarding improvements on measures of psychological functioning were not significant (all \(p>0.06\)).
Table 7.13 Results from generalised estimating equation analysis for Treatment by Time effects on treatment outcomes

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Wald $\chi^2$</th>
<th>$p$</th>
<th>Four-week assessment</th>
<th>12-week assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>$B$</td>
<td>$SE$</td>
</tr>
<tr>
<td><strong>Cannabis use frequency and quantity outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of abstinent days (28-day) $(n=396)$</td>
<td>3.92</td>
<td>0.141</td>
<td>0.35</td>
<td>0.18</td>
</tr>
<tr>
<td>Hours spent ‘high’ per day $(n=322)$</td>
<td>14.71</td>
<td>0.001</td>
<td>0.86</td>
<td>0.30</td>
</tr>
<tr>
<td>Quantity of cannabis on typical day $(n=389)$</td>
<td>5.7</td>
<td>0.059</td>
<td>0.80</td>
<td>0.30</td>
</tr>
<tr>
<td><strong>Cannabis-related problems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannabis problems $(n=370)$</td>
<td>28.65</td>
<td>&lt;0.001</td>
<td>0.81</td>
<td>0.15</td>
</tr>
<tr>
<td>Cannabis dependence $(n=480)$</td>
<td>30.0</td>
<td>&lt;0.001</td>
<td>0.50</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Other substance use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90-day tobacco use frequency $(n=395)$</td>
<td>2.39</td>
<td>0.303</td>
<td>0.42</td>
<td>0.27</td>
</tr>
<tr>
<td>90-day alcohol use frequency $(n=368)$</td>
<td>0.09</td>
<td>0.957</td>
<td>0.06</td>
<td>0.22</td>
</tr>
<tr>
<td>90-day illicit drug use frequency $(n=395)$</td>
<td>0.47</td>
<td>0.793</td>
<td>0.40</td>
<td>0.61</td>
</tr>
<tr>
<td>% tobacco in cones $(n=388)$</td>
<td>6.75</td>
<td>0.034</td>
<td>0.44</td>
<td>0.18</td>
</tr>
<tr>
<td><strong>Psychological functioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K-10 $(n=394)$</td>
<td>2.31</td>
<td>0.315</td>
<td>0.09</td>
<td>0.07</td>
</tr>
<tr>
<td>EQ5D index $(n=396)$</td>
<td>4.25</td>
<td>0.119</td>
<td>0.09</td>
<td>0.05</td>
</tr>
<tr>
<td>EQ5D scale $(n=389)$</td>
<td>0.98</td>
<td>0.612</td>
<td>0.04</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Note: significant relationships (at $p<0.05$) are noted in bold

*K-10*=Kessler-10 scale, *EQ5D*=EuroQol 5-dimension scale

* Data for this variable has been pooled following an intention-to-treat analysis with five imputations

a: taking medication during trial participation significantly correlated with this variable outcome and was included as a covariate in analysis

b: utilising concurrent external treatment during trial participation significantly correlated with this variable outcome and was included as a covariate in analysis

**Aim three: Clinical significance of cannabis use outcomes**

Based on Stephens et al.’s measure of clinical significance,\textsuperscript{160} clinically significant improvement was defined as greater than 50% reduction in cannabis use (determined by
a difference in the number of cones smoked in 28 days prior to assessment, as measured by TLFB interview) and no report of cannabis-related problems at final follow-up (as measured by the CPQ). As hypothesised, the results of a chi-square analysis highlighted a difference between groups indicating that control participants were significantly less likely to report clinically significant improvement compared to intervention participants at four weeks ($\chi^2 = 6.2, p = 0.013; OR = 0.26$ [95% CI = 0.09-0.79]) and at 12 weeks ($\chi^2 = 4.9, p = 0.027; OR = 0.39$ [95% CI = 0.17-0.91]). At four weeks, one in five intervention participants had clinically significant improvements compared to approximately one in ten control participants (22.2% compared to 6.9%). These figures increased to one in three intervention participants at 12 weeks compared to one in five control participants (38.8% compared to 19.7%).

**Aim four: Predictors of change**

To address the first part of the fourth aim of Project CAHL, to describe the extent to which certain participant characteristics were correlated with cannabis-related treatment outcomes, a two-tailed correlation analysis was conducted between baseline participant characteristics and the change in outcomes from baseline to four weeks (presented in Table 7.14) and to 12 weeks (presented in Table 7.15). Bonferroni corrections were made to control for the probability of false positive results ($p < 0.003$ was considered statistically significant).

Those participants’ with superior baseline socio-economic status and physical and mental health (measured by the Kessler-10 scale and the EQ-5D) and who were in the action stage of change showed the strongest associations with positive changes in cannabis-related outcomes from baseline to four weeks. In contrast, positive changes in
these outcomes from baseline to 12 weeks were most strongly associated with those participants’ with high socio-economic status and expectations regarding the credibility of the treatment (measured by the adapted CEQ), and low levels of psychiatric distress (measured by the Kessler-10 scale). Two noted exceptions were that, compared to high expectations of treatment, low expectations were associated with a reduced number of hours spent high, and with a reduced percentage of tobacco mulled into a cannabis joint.
Table 7.14 Associations between participant characteristics at baseline and change in treatment outcomes at the four-week assessment

<table>
<thead>
<tr>
<th>Baseline characteristics*</th>
<th>Cannabis frequency</th>
<th>Cannabis quantity</th>
<th>Cannabis dependence</th>
<th>Cannabis related problems</th>
<th>Meaningful improvement</th>
<th>Hours spent *‘high’ per day</th>
<th>% tobacco used with cannabis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r )</td>
<td>( p )</td>
<td>( r )</td>
<td>( p )</td>
<td>( r )</td>
<td>( p )</td>
<td>( r )</td>
</tr>
<tr>
<td>Gender</td>
<td>0.206</td>
<td>0.021</td>
<td>0.049</td>
<td>0.587</td>
<td>0.016</td>
<td>0.855</td>
<td>0.124</td>
</tr>
<tr>
<td>Age</td>
<td>0.066</td>
<td>0.465</td>
<td>0.031</td>
<td>0.732</td>
<td>0.089</td>
<td>0.269</td>
<td>0.177</td>
</tr>
<tr>
<td>SES</td>
<td>0.037</td>
<td>0.685</td>
<td>0.192</td>
<td>0.032</td>
<td>0.052</td>
<td>0.522</td>
<td>0.010</td>
</tr>
<tr>
<td>Number of friends</td>
<td>0.060</td>
<td>0.505</td>
<td>0.142</td>
<td>0.112</td>
<td>0.036</td>
<td>0.653</td>
<td>0.010</td>
</tr>
<tr>
<td>Satisfaction with social support</td>
<td>0.050</td>
<td>0.575</td>
<td>0.016</td>
<td>0.856</td>
<td>0.056</td>
<td>0.492</td>
<td>0.122</td>
</tr>
<tr>
<td>Regular use (years)</td>
<td>0.025</td>
<td>0.777</td>
<td>0.014</td>
<td>0.879</td>
<td>0.060</td>
<td>0.462</td>
<td>0.181</td>
</tr>
<tr>
<td>Treatment credibility</td>
<td>0.128</td>
<td>0.193</td>
<td>0.019</td>
<td>0.845</td>
<td>0.085</td>
<td>0.333</td>
<td>0.078</td>
</tr>
<tr>
<td>Treatment history (use of medications)</td>
<td>0.035</td>
<td>0.705</td>
<td>0.093</td>
<td>0.319</td>
<td>0.095</td>
<td>0.247</td>
<td>0.030</td>
</tr>
<tr>
<td>Kessler-10</td>
<td>0.147</td>
<td>0.101</td>
<td><strong>0.335</strong></td>
<td><strong>0.000</strong></td>
<td>0.215</td>
<td>0.007</td>
<td>0.184</td>
</tr>
<tr>
<td>EQ5D scale</td>
<td>0.003</td>
<td>0.975</td>
<td>0.219</td>
<td>0.014</td>
<td>0.141</td>
<td>0.085</td>
<td>0.146</td>
</tr>
<tr>
<td>EQ5D index</td>
<td>0.101</td>
<td>0.262</td>
<td><strong>0.339</strong></td>
<td><strong>0.000</strong></td>
<td><strong>0.285</strong></td>
<td><strong>0.000</strong></td>
<td>0.133</td>
</tr>
<tr>
<td>Stage of change</td>
<td><strong>0.412</strong></td>
<td><strong>0.002</strong></td>
<td>0.365</td>
<td>0.007</td>
<td><strong>0.277</strong></td>
<td><strong>0.001</strong></td>
<td>0.046</td>
</tr>
<tr>
<td>Confidence to avoid cannabis use</td>
<td>0.142</td>
<td>0.113</td>
<td>0.109</td>
<td>0.224</td>
<td>0.122</td>
<td>0.137</td>
<td>0.160</td>
</tr>
<tr>
<td>Social motives</td>
<td>0.040</td>
<td>0.656</td>
<td>0.103</td>
<td>0.252</td>
<td>0.059</td>
<td>0.488</td>
<td>0.062</td>
</tr>
<tr>
<td>Coping motives</td>
<td>0.008</td>
<td>0.929</td>
<td>0.107</td>
<td>0.231</td>
<td>0.003</td>
<td>0.971</td>
<td>0.063</td>
</tr>
<tr>
<td>Enhancement motives</td>
<td>0.024</td>
<td>0.789</td>
<td>0.131</td>
<td>0.144</td>
<td>0.021</td>
<td>0.798</td>
<td>0.026</td>
</tr>
<tr>
<td>Medication motives</td>
<td>0.038</td>
<td>0.674</td>
<td>0.070</td>
<td>0.434</td>
<td>0.013</td>
<td>0.872</td>
<td>0.019</td>
</tr>
<tr>
<td>Expansion motives</td>
<td>0.049</td>
<td>0.584</td>
<td>0.064</td>
<td>0.478</td>
<td>0.032</td>
<td>0.685</td>
<td>0.061</td>
</tr>
</tbody>
</table>

Note: Following Bonferroni corrections the significant relationships (at \( p < 0.003 \)) are indicated in bold; “SES”=Socio-economic Status, “EQ5D”=EuroQol 5-dimension (the physical health scale and quality of life index are shown)

*No significant correlation was found between participant groups regarding these baseline participant characteristics
Table 7.15 Associations between participant characteristics at baseline and change in treatment outcomes at the 12-week assessment

<table>
<thead>
<tr>
<th>Baseline characteristics*</th>
<th>Cannabis frequency</th>
<th>Cannabis quantity</th>
<th>Cannabis dependence</th>
<th>Cannabis related problems</th>
<th>Meaningful improvement</th>
<th>Hours spent ‘high’ per day</th>
<th>% tobacco used with cannabis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r  p</td>
<td>r  p</td>
<td>r  p</td>
<td>r  p</td>
<td>r  p</td>
<td>r  p</td>
<td>r  p</td>
</tr>
<tr>
<td>Gender</td>
<td>0.241 0.011</td>
<td>0.086 0.387</td>
<td>0.053 0.518</td>
<td>0.100 0.297</td>
<td>0.192 0.044</td>
<td>0.031 0.775</td>
<td>0.010 0.919</td>
</tr>
<tr>
<td>Age</td>
<td>0.095 0.325</td>
<td>0.202 0.040</td>
<td>0.208 0.011</td>
<td>0.107 0.265</td>
<td>0.126 0.188</td>
<td>0.231 0.032</td>
<td>0.109 0.259</td>
</tr>
<tr>
<td>SES</td>
<td>0.050 0.608</td>
<td>0.187 0.059</td>
<td>0.049 0.553</td>
<td>0.156 0.104</td>
<td>0.019 0.845</td>
<td>0.320 0.003</td>
<td>0.131 0.178</td>
</tr>
<tr>
<td>Number of friends</td>
<td>0.152 0.317</td>
<td>0.053 0.729</td>
<td>0.096 0.237</td>
<td>0.054 0.726</td>
<td>0.054 0.726</td>
<td>0.002 0.993</td>
<td>0.205 0.183</td>
</tr>
<tr>
<td>Satisfaction with social support</td>
<td>0.102 0.503</td>
<td>0.046 0.765</td>
<td>0.088 0.276</td>
<td>0.082 0.591</td>
<td>0.046 0.763</td>
<td>0.022 0.905</td>
<td>0.034 0.828</td>
</tr>
<tr>
<td>Regular cannabis use (years)</td>
<td>0.012 0.901</td>
<td>0.153 0.122</td>
<td>0.121 0.150</td>
<td>0.001 0.994</td>
<td>0.189 0.048</td>
<td>0.134 0.218</td>
<td>0.065 0.504</td>
</tr>
<tr>
<td>Treatment credibility (use of medications)</td>
<td>0.329 0.001</td>
<td>0.395 0.000</td>
<td>0.259 0.004</td>
<td>0.223 0.033</td>
<td>0.241 0.021</td>
<td>0.400 0.000</td>
<td>0.342 0.001</td>
</tr>
<tr>
<td>Treatment history</td>
<td>0.019 0.854</td>
<td>0.002 0.981</td>
<td>0.095 0.265</td>
<td>0.095 0.346</td>
<td>0.029 0.770</td>
<td>0.002 0.989</td>
<td>0.084 0.409</td>
</tr>
<tr>
<td>Kessler-10</td>
<td>0.143 0.138</td>
<td>0.167 0.091</td>
<td>0.302 0.000</td>
<td>0.413 0.000</td>
<td>0.016 0.871</td>
<td>0.350 0.001</td>
<td>0.158 0.103</td>
</tr>
<tr>
<td>EQ5D health</td>
<td>0.137 0.154</td>
<td>0.090 0.362</td>
<td>0.124 0.139</td>
<td>0.090 0.348</td>
<td>0.144 0.132</td>
<td>0.152 0.160</td>
<td>0.001 0.994</td>
</tr>
<tr>
<td>EQ5D index</td>
<td>0.078 0.418</td>
<td>0.043 0.661</td>
<td>0.166 0.041</td>
<td>0.238 0.012</td>
<td>0.025 0.796</td>
<td>0.271 0.011</td>
<td>0.018 0.853</td>
</tr>
<tr>
<td>Stage of change</td>
<td>0.315 0.027</td>
<td>0.065 0.679</td>
<td>0.231 0.004</td>
<td>0.145 0.321</td>
<td>0.287 0.045</td>
<td>0.339 0.024</td>
<td>0.077 0.601</td>
</tr>
<tr>
<td>Confidence to avoid cannabis use</td>
<td>0.050 0.607</td>
<td>0.081 0.414</td>
<td>0.052 0.558</td>
<td>0.103 0.282</td>
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<td>0.052 0.538</td>
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<td>0.019 0.842</td>
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<td>0.014 0.887</td>
<td>0.098 0.367</td>
<td>0.055 0.573</td>
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Note: Following Bonferroni corrections the significant relationships (at p<0.003) are indicated in bold; “SES”=Socio-economic Scale, “EQ5D”=EuroQol-dimension (the physical health scale and quality of life index are shown)

*No significant correlation was found between participant groups regarding these baseline participant characteristics
Aim five: The effect of confidence to avoid cannabis on reductions in cannabis use

To determine the mediating effect of confidence to avoid use between-group reductions in cannabis use, a mediation analysis was conducted, as presented in Figure 7.1. A significant relationship was observed between participant group and number of abstinent days at 12 weeks (c: $p=0.039$). Confidence to avoid cannabis use (measured by the custom confidence scale) was tested to determine if this variable mediated the relationship. As hypothesised, the bootstrapped tests of indirect effects highlighted a significant relationship between participant group and confidence to avoid use at four weeks (a: $p=0.033$), and between confidence to avoid use at four weeks and abstinent days at 12 weeks (b: $p<0.001$).

Figure 7.1 Confidence in avoiding cannabis use at four weeks as a mediator of the relationship between participant group and cannabis use at 12 weeks.

Coefficient for total effect of mediation = -3.66 (95% CI= -6.15 - -1.71); Regression coefficients are standardized. All significance tests were one-tailed given that hypotheses were directional. Whether or not the participant had received treatment or used medication outside of the intervention were included as covariates in the regression analyses to control for external influences. *$p<.05$; **$p<.001$. 

296
Results were consistent with partial mediation and indicated that 71% of the intervention effect on days of cannabis use at 12 weeks (c) was mediated by the participant’s change in confidence to avoid use at four weeks (according to MacKinnon’s formula: $ab/ [ab+ c']$).

To ensure that a reduction in the participants’ frequency of cannabis use from baseline to four weeks was not statistically significantly related to changes in confidence to avoid cannabis use, and perhaps the underlying reason that confidence to avoid cannabis mediated the relationship between study groups and abstinent days at 12 weeks, a zero-order and partial correlation analysis was conducted. The zero-order correlation between changes in participants’ confidence to avoid cannabis use from baseline to four weeks and number of abstinent days at 12 weeks was significant ($r=0.36, p<0.001$). After controlling for changes in abstinent days from baseline to four-week follow-up, the partial correlation between changes in confidence to reduce use and abstinent days at 12 weeks remained significant ($r=0.20, p=0.040$) and according to Fisher’s Z-test, the difference between the zero-order and the partial correlations was not statistically significant ($p>0.05$). As such, changes in the frequency of cannabis use from baseline to four weeks may not have accounted for the ability of the participants’ confidence to avoid cannabis use to mediate the relationship between participant groups and number of abstinent days at 12 weeks.

**DISCUSSION**

The first aim of Project CAHL was to determine whether the intervention was delivered as intended. Treatment fidelity ratings reported by the counsellors and the candidate indicated that all components of the four sessions were delivered accurately. The counsellors and participants both reported establishing a strong working alliance. In
addition, a minority of participants allocated to the intervention did not answer their phone to begin participation \((n=11; \text{14\% of intervention participants})\), while half of the intervention participants completed all four sessions \((n=42; \text{53\% of intervention participants})\). Further, the majority of participants made use of the Workbook between sessions and had the Workbook for reference during the sessions \((70-89\% \text{ and } 64-86\% \text{ of participants, respectively})\).

The second aim of this trial was to test the hypothesis that intervention participants would show a greater reduction in cannabis and other substance use, cannabis-related problems (including physical and mental health), and cannabis dependence severity compared with control. The results showed partial support for this hypothesis. Specifically, the intervention participants reported a statistically significantly reduced number of hours in the day spent ‘high’ and a reduced severity of dependence, and number of cannabis-related problems, at four-week and 12-week follow-up. Contrary to the hypothesis, the intervention participants did not report statistically significantly greater reductions in the number of cannabis cones smoked on a typical day of use, or in the number of days when cannabis and other substances were used, and did not report greater improvements in psychological functioning, compared to control participants.

The third aim of this trial was to determine the clinical meaningfulness of the reductions reported. Utilising Stephen et al.’s\(^{160}\) definition of clinically significant improvement, one in five intervention participants had ‘improved’ at four weeks, to a peak of one in three intervention participants at 12 weeks. This proportion was statistically significantly greater than the proportion of control participants achieving improvement \((7\% \text{ and } 20\% \text{ at four and 12 weeks})\).
The fourth aim was to determine the baseline predictors of positive changes in cannabis-related outcomes. More positive outcomes were found to be best predicted by being in the action stage of change at baseline and by superior physical and mental health and socio-economic advantage, and by higher expectations of treatment credibility.

The final aim was to test the effect of the participants’ confidence to avoid cannabis use on cannabis frequency at 12 weeks. A mediation analysis showed that intervention participants were statistically significantly more confident than the control group in their ability to avoid cannabis use (as demonstrated at four week follow up) and, in turn, reported a greater number of abstinent days at 12 weeks.

**Treatment adherence**

Although a non-significant trend was found (all $p>0.09$), intervention participants who completed the four CAHL intervention sessions did not report statistically significantly improved treatment outcomes compared to participants who did not fully adhere to all sessions (including those who completed only one of four sessions, or ‘partial completers’). Notably, this lack of statistically significant difference between treatment completers and partial completers may have reflected a lack of statistical power to detect variance due to the small numbers of partial completers who completed the follow-up assessments. Regardless, the lack of difference is consistent with three other cannabis intervention trials which have suggested that partial treatment attendance may be as important as complete treatment adherence in assisting with cannabis use reductions. That is, no statistically significant differences in treatment outcomes were reported between intervention participants who only partially completed treatment compared to those completing treatment. Further, some authors argue that it is the participants’ perception that the number of sessions delivered was adequate that may
be more predictive of outcomes than completing treatment.\textsuperscript{602} That said, the importance of treatment adherence should not be discounted. Despite the lack of significance between treatment completers and partial completers in treatment outcomes, there was a trend for intervention completers to report greater outcomes than partial completers, particularly regarding reductions in tobacco and alcohol use. Further, this trend is consistent with a body of work supporting the predictive power of treatment adherence regarding cannabis outcomes following clinical trial intervention,\textsuperscript{342, 354-356} and following long-term substance use residential programs and outpatient programs.\textsuperscript{894} As such, future work is warranted to better determine if a single session intervention can result in comparable treatment outcomes or whether a number of sessions are first required to build participants’ skills in order to gradually effect greater reductions in cannabis use.

In contrast, the use of the \textit{Workbook} did statistically significantly correlate with improved treatment outcomes. Intervention participants were encouraged to have the \textit{Workbook} with them during the sessions (which were arranged to be at a convenient time); however this was not always the case. Notably, intervention participants who reported having the \textit{Workbook} handy during the first two intervention sessions (64\% and 89\% of participants, respectively) reported statistically significantly improved physical and mental health at four- and 12-week follow-up, and a greater number of abstinent days at four weeks, compared to intervention participants who did not refer to the \textit{Workbook} during these sessions. In addition, compared to non-compliant intervention participants, those who reported completing self-help exercises between sessions one and two, and between sessions three and four, reported a statistically significantly reduced severity of dependence and quantity of cannabis used on a typical
day, respectively. This finding is consistent with a large body of research supporting the use of self-help materials in conjunction with counsellor-led treatment.\textsuperscript{598, 600, 602, 606, 852}

Treatment outcomes and their clinical meaningfulness

In this study, both participant groups showed statistically significant improvements between the baseline and the four-week and 12-week follow-up interviews on measures of cannabis use frequency and quantity, confidence to avoid cannabis use, severity of cannabis dependence, and cannabis use related problems. Further, with the exception of socio-economic status, participant demographic characteristics were not statistically significantly associated with outcomes. At the four- and 12-week follow-up assessments, however, a statistically significantly greater number of intervention participants reported achieving a clinically meaningful improvement compared to the control group. That is, one in five intervention participants reported clinically significant improvements (abstinence from cannabis and no reported cannabis-related problems) compared to approximately one in ten control participants (22\% compared to 7\%). These figures increased to one in three intervention participants at 12 weeks compared to one in five control participants (39\% compared to 20\%). As such, the CAHL intervention showed efficacy compared with a lack of intervention in that the chances of achieving significant improvement were approximately doubled.

Notably, at 12 weeks, under half of the intervention participants’ responses were indicative of cannabis dependence compared to over two thirds of control participants (45\% compared to 72\%). In combination with the results that one in five intervention participants showed meaningful improvement, these results are encouraging. As with face-to-face cannabis use treatments, however, the majority of participants continued to use cannabis at final follow-up (see Chapter Two, p. 92 for a review).
Putting the clinical utility of the CAHL intervention into perspective

These results can be compared to a previous randomised controlled trial of two cannabis use interventions which utilised the same definition of improvement and also included a 12 week follow-up assessment. The participants of these two interventions were somewhat similar to the current study as 76% were male, and participants reported a mean age of 32 years, were using cannabis on 90% of days and had used for a mean of 15 years (compared to Project CAHL participants who were 62% male, with a mean age of 36 years who used cannabis on 80% of days, and had used for a mean of 16 years). The two interventions, however, were somewhat different to the CAHL intervention. The interventions were a ten-session relapse prevention intervention and a ten session social support intervention, each delivered in group format over 12 weeks by tertiary educated counsellors following four two-hour training sessions. Unlike the CAHL intervention participants who were reimbursed for their time, there was a fee for participation in these two interventions (participants were refunded in full across follow-up assessments with study adherence). At 12 weeks from the baseline assessment, over half of participants from these relapse prevention and social support interventions were clinically improved (61% and 54%, respectively, compared to 39% of Project CAHL participants).

Although the majority of participants in these two face-to-face interventions reported clinical improvement at 12 weeks from baseline assessment compared with the minority of CAHL intervention participants, the comparison is somewhat confounded. First, Stephens et al.’s interventions were delivered in a group format over a period of 12 weeks meaning that the interventions were of greater duration and, as such, the follow-up assessment was completed immediately post treatment. In contrast, the CAHL
intervention was delivered individually and over four weeks, with the corresponding assessment completed eight weeks post treatment-end. Second, Stephens et al.’s interventions were delivered in a fixed location and participants were asked to make a refundable deposit of $50 USD to participate. In comparison, the CAHL intervention may have attracted a less motivated group of participants by not requiring them to travel and by reimbursing them for participating. Unfortunately, Stephens et al.’s trial did not report on the motivation of participants so this postulation cannot be tested

**Benchmarking the reductions reported by CAHL intervention participants**

The CAHL intervention participants reported being abstinent on 73% of days in the month prior to the 12-week assessment compared to 55% by the control group. This percentage of abstinent days was comparable to the most comprehensive and intensive trial of MI+CBT-based cannabis treatments - the Marijuana Treatment Project Research Group (MTPRG) trial.\(^3^4^5\) The MTPRG trial included a two session and a nine session face-to-face intervention, each delivered over 12 weeks by tertiary educated counsellors following two full day training sessions.\(^3^4^5\) In this trial, the participants (\(n=450\)) were 68.4% male, and reported an average age of 36 years and were using cannabis on 91% of days, with a mean of 18 years smoking. At four months post-baseline the two- and nine-session intervention participants reported abstinence on 44% and 64% of the 90 days prior to assessment, compared to 24% of days by the control participants. Thus, the CAHL intervention was delivered without visual cues and resulted in somewhat comparable treatment gains to a more intensive face-to-face treatment (the CAHL intervention was delivered over four weekly one-hour sessions compared to 9 one-hour sessions over 12 weeks for the MTPRG trial).\(^3^4^5\)
The difference between the abstinence rates reported by the control group of the CAHL trial and the MTPRG trial also was noteworthy. Both trials used a delayed treatment control group, yet the MTPRG control group participants reported achieving abstinence from cannabis on 24% of days at four-months compared to 55% of days by the Project CAHL control group at 12 weeks. Two explanations for the greater proportion of Project CAHL control participants achieving abstinence should be considered. First, the sample of Project CAHL participants may reflect a group that was particularly motivated to reduce cannabis use prior to recruitment. That is, the majority of Project CAHL participants were in the action (58%) or preparation (15%) stages of change at baseline. Unfortunately comparison with the MTPRG trial was not possible as the participants’ motivation to reduce cannabis use was not reported. Second, the difference may reflect the impact of the initial call to the CIH prior to recruitment. That is, each participant to Project CAHL was recruited through the CIH service and, as such, had spoken to a counsellor about their cannabis use. This minimal interaction may have been a catalyst for later reductions in cannabis use. This explanation is consistent with the high proportion of control participants reporting point-prevalence abstinence at six months (59%) in a telephone-based cannabis intervention trial which also recruited participants through an existing helpline.  

Treatments outcomes and comparisons with a single session telephone-based cannabis intervention

Fernandes et al. conducted a randomised controlled trial of a telephone-based fifteen minute, single session, cannabis intervention in Brazil. This trial reported point-prevalence abstinence rates (referred to as “ceased use”) at 180 days following the participant’s “self-established marijuana cessation date” (p.752).
participants were statistically significantly more likely to report abstinence compared to the control group (73% compared to 59%). Although these abstinence rates were high, the trial did not report on the criteria for reaching abstinence (for example, the number of days without use) and did not control for participants who were receiving concurrent professional help (38% of the sample). By way of comparison, participants of the CAHL intervention reported abstinence on 73% of the previous 28 days to 12-week (90-day) assessment, while control participants reported abstinence on 55% of days. However, participants of the CAHL intervention reported statistically significantly greater reductions in cannabis dependence severity and cannabis-related problems compared to control participants – two treatment outcomes not measured in Fernandes et al.’s trial. Thus, without further study, the results from Project CAHL could not confirm that a telephone-based, four session cannabis intervention was more or less efficacious than a single session telephone-based intervention. Notably, both telephone interventions highlighted efficacy compared to wait list controls.

The influence of common factors on treatment outcomes

In 1936, Rosenzweig brought attention to what he termed ‘common factors’, or those factors relating to treatment outcomes that are not specific to the treatment delivered (such as expectations and confidence in treatment, accurate empathy, or positive regard). Common factors are generally considered to be instrumental in effecting treatment outcomes, and are important in explaining the finding that treatment outcomes relating to different forms of psychotherapy are often similar (often referred to as the ‘dodo effect’). Two of the most commonly cited common factors were measured in Project CAHL - working alliance and treatment expectations. Unfortunately, measurement of a number of other common factors was out of the scope.
of Project CAHL. Specifically, change processes such as the opportunity for catharsis or the practice of new behaviours, personal qualities of the counsellor, and treatment factors such as including specific techniques, exploration of emotional issues and having a healing setting.  

Working alliance is generally defined as the collaborative, working relationship and bond shared between a patient and counsellor. An effective working alliance is typically considered to be a strong predictor of positive treatment outcomes, particularly when the alliance is measured by the treatment clients. Project CAHL intervention participants and counsellors both reported that a strong working alliance was formed (both groups reported a mean alliance score above 70 out of 84 on the Working Alliance Inventory). Increases in the participant ratings of working alliance predicted increases in frequency of abstinent days at 12 weeks, although no further statistically significant relationships between alliance ratings and treatment outcomes were found. Counsellor ratings of working alliance, however, did not statistically significantly predict treatment outcomes. Thus, the variability in working alliance only partially predicted treatment outcomes. Two untested hypotheses may explain this disparity in the predictive power of the counsellors’ and participants’ working alliance ratings. First, the participants may have experienced a ‘halo’ effect where those who believed that they improved also rated the working alliance positively. Second, the counsellors attended to multiple participants concurrently and may not have recalled the working alliance formed across the four-week intervention period as accurately as the participants.  

Client expectations have long been considered an important common factor in psychotherapy, and more recently in substance use treatment.
expectations of a treatment’s utility (typically measured at baseline), and greater perceived credibility, are consistently associated with positive mental health treatment outcomes.\textsuperscript{788-793, 909} The influence of client expectations of substance use treatments on outcomes lacks the attention received by mental health treatments and is less well known. Treatment expectations regarding the credibility of the CAHL intervention were found to be a significant predictor of variation in the number of abstinent days, quantity of cannabis used and number of hours spent high on a typical day, severity of dependence, and the percentage of tobacco used with cannabis at 12 weeks. No further relationships between treatment credibility and treatment outcomes were found to be statistically significant at four- or 12-week assessments and no statistically significant between-group differences were noted. This association between treatment expectations and treatment outcomes is consistent with previous studies that measured expectations of mental health interventions at one particular point in time,\textsuperscript{910, 911} and more dynamic study assessing the malleability of expectations.\textsuperscript{912} The results also were consistent with an initial study regarding expectations in substance use treatment where expectations regarding the openness of the counselling process, and an expectation that the client would take an active role in the counselling process, predicted reductions in substance use.\textsuperscript{765}

Although the two most frequently reported common factors were addressed in Project CAHL, several other unmeasured common factors may have influenced the relationship between trial groups and treatment outcomes. These confounding influences are a concern in any treatment trial; however, analyses of the measured factors supported the internal validity of the reported treatment effect.
Mechanism of change - participant confidence to avoid cannabis use

Motivation to change and confidence in being able to change (often collectively referred to as self-efficacy) are consistently reported as predictors of substance use treatment outcomes, and are guiding principles to motivational interviewing. Previous study of cannabis use interventions has identified both a univariate and a multivariate relationship between self-efficacy to reduce cannabis use and treatment outcomes, particularly when rated post-treatment. Recent research on cannabis use treatment, however, has not replicated this finding. Rather, these authors argue that the counsellors’ and participants’ verbal behaviours within sessions may be more likely to identify processes that explain the effects of motivational interventions.

The Project CAHL participants’ increase in confidence to avoid cannabis use (as measured at four-week assessment) explained 71% of the relationship between participant group allocation and the number of reported days of cannabis abstinence at 12 weeks. That is, participants in the intervention group reported a greater number of days without using cannabis than control participants, largely because participation in the intervention resulted in a statistically significant increase in their confidence to avoid cannabis use. Further, this relationship was statistically significant when controlling for changes in cannabis use frequency from baseline to four weeks. As such, the treatment components which increase the participants’ confidence to avoid use may be particularly important in promoting reductions in cannabis use. Thus, for this MI+CBT combined intervention, the motivational interviewing components may have been more effective in promoting reductions in cannabis use frequency compared with the cognitive behavioural therapy components.
Secondary treatment outcomes – other substance use outcomes

Project CAHL participants did not report a statistically significant reduction in substance use other than cannabis. Intervention participants who completed the four treatment sessions showed greater reductions, however, the sample size of this group was small and the difference in reductions reported by this group and the control group was not found to be statistically significant. This lack of treatment effect is consistently reported by face-to-face cannabis use interventions

although participants from a handful of such interventions have reported some statistically significant reductions in other substance use.

This finding may be driven by three separate factors. First, as with Project CAHL, cannabis use intervention trials generally exclude heavy or dependent users of other illicit drugs in order to improve the internal validity of the intervention at the expense of generalisability (external validity). This allows the intervention to focus on a single drug of concern. As such, the lack of reductions in other substance use reported by Project CAHL participants, and other cannabis use intervention trials, may result from a lack of a focus on other substance use throughout the intervention. Second, given that a low severity of other substance use is typically a trial inclusion criteria, the lack of statistically significant reductions may also simply reflect a lack of desire or need to reduce other substance use. This explanation was consistent with the majority of Project CAHL participants who reported using other illicit substances an average of once in the 90 days prior to baseline assessment, and consumed alcohol once or twice a week on average. Third, some participants who reduce their cannabis use may substitute cannabis for another substance and thus make overall reductions in other substances less
likely. This explanation, however, is not typically supported by face-to-face cannabis intervention trials,\textsuperscript{914} and was not consistent with the Project CAHL results.

Notably, intervention participants reported a statistically significantly greater reduction in the amount of tobacco used in cannabis cones compared to control participants. This difference may be explained by the trial methods. Counsellors were asked to encourage reductions in “smoking” which could have been interpreted by participants to include tobacco. However, as with other substance use, tobacco cigarette smoking in the 90 days prior to the follow-up interviews was not found to statistically significantly reduce for participants of Project CAHL.

**Secondary treatment outcomes – health related outcomes**

The Project CAHL participants reported a statistically significant improvement in levels of psychiatric distress and health related quality of life, from baseline to 12-week follow-up, although no intervention effect was found. This lack of intervention effect is consistent with several previous cannabis use face-to-face interventions,\textsuperscript{341, 342, 345, 351-353} although not all.\textsuperscript{345, 356, 361} Three previous trials of cannabis use interventions have reported statistically significant between-group treatment gains on measures of psychopathology outcomes.\textsuperscript{345, 356, 361} Two important differences between these trials and Project CAHL make a comparison difficult. First, each of these trials involved MET+CBT-based interventions of at least ten 90 minute face-to-face sessions compared to the four, 60-minute sessions of the CAHL intervention. Second, each of the trials included a different secondary generic measure of psychopathology. That is, at 12 weeks, these trials individually reported treatment gains on a measure of state-based anxiety,\textsuperscript{345} a brief measure of psychopathology symptoms,\textsuperscript{356} and a measure of adolescent externalising and internalising behaviours.\textsuperscript{361}
Putting the secondary treatment outcomes into perspective – health related quality of life

The measure of health related quality of life that was employed in the CAHL intervention (the EQ-5D index) was utilised previously in a study of three Australian telephone mental health helplines.\textsuperscript{497} Callers to these helplines were invited to participate in a user satisfaction survey with 80 callers agreeing to participate. Participants were asked to complete the EQ-5D index and report two scores; one indicating how they felt following their telephone call and one retrospectively reflecting how they felt prior to the call. This study concluded that a typical call to a mental health helpline would result in an average before-after improvement on the EQ-5D index of 0.06 (increasing from a mean index score of 0.57 to 0.63). Using a \textit{time trade-off} explanation of these index scores,\textsuperscript{915} the improvements reported indicated that participants would have traded 10 years of ill health for 5.7 years of perfect health before the call. Following the call to the service, however, these participants would have traded the 10 years of ill health for 6.3 years of perfect health after the call. Unfortunately, no information was given as to whether or not the reported improvement was statistically significant.\textsuperscript{497}

In comparison, participants of Project CAHL achieved an average improvement on the EQ-5D index from baseline to 12-week follow up of 0.09 (increasing from a mean index score of 0.75 to 0.84). This improvement was statistically significant, although no significant between-group difference was noted. Thus, callers to the CIH who participated in Project CAHL went on to report comparable improvements in quality of life at 12 weeks compared to those calling mental health helplines in Australia (although this result was not driven by participation in the CAHL intervention).
Australian norms are available regarding the EQ5D scores reported by individuals in the general community and among inpatients and outpatients of medical hospitals. 915

According to this data, the health related quality of life reported by intervention participants at 12-week follow-up (0.88) was comparable to those in the general community (0.85) and above that of inpatients and outpatients of Melbourne hospitals (0.70 and 0.53, respectively). 915

In regards to the EQ5D physical health scale, the CAHL participants reported a mean health score of 63 out of 100 at baseline which increased statistically significantly to 72 out of 100 at 12 weeks, with no significant between-group differences. For this variable, Australian norms were unavailable; however, US norms show that the average individual in the US population reports a health score that is 21 units higher (at 84 out of 100) than the CAHL participants score at 12 weeks. 873

**Putting the secondary treatment outcomes into perspective – psychological distress**

The measure of psychological distress that was employed in the CAHL intervention (the Kessler-10) was utilised in the 2010 Australian National Drug Strategy Household Survey. 49 As such, a comparison between the levels of distress by Project CAHL participants can be made with the population in general and among those who use cannabis specifically. In this trial, participants reported baseline levels of distress as: low (11%), moderate (21%), and high to very high (68%). At 12 weeks participants had significantly improved, and were more likely to report low distress (42%), and less likely to report moderate (17%), and high or very high distress (41%). No statistically significant differences in these improvements were reported between the intervention and control groups. In comparison to population levels of distress, even following participation in Project CAHL, the participants were significantly more likely to report
being in moderate and high levels of distress (58% of participants compared to 30% of the general population and 43% of recent cannabis users).49

**Generalisability of findings**

Given the novelty of this telephone-based cannabis intervention, it was of interest to determine whether or not the CAHL participants differed from treatment seekers in the community and from participants in previous trials of face-to-face cannabis interventions. That is, if the demographic profile and substance use behaviours reported by Project CAHL participants closely matched cannabis treatment seekers of face-to-face interventions it would support the generalizability of this trial to cannabis treatment seekers as a whole.

*Participant profile and comparisons with face-to-face cannabis use treatment seekers*

Participants of Project CAHL reflected a motivated sample of cannabis treatment seekers. That is, the vast majority of the total sample had at least contemplated a reduction (90%), and about half of participants were actively making reductions in their use at the time of their call to the Cannabis Information Helpline (CIH) (46%). Of all the individuals who called the CIH for assistance, one third were interested in participating in Project CAHL – a comparable number to those seeking treatment for substance dependence.586 That is, in the US and Australia 15% and 17% of males and 21% and 33% of females sought treatment for substance dependence during the 12 months prior to survey (in the 1992 US National Comorbidity Survey and the 1997 Australian National Survey of Mental Health and Wellbeing, respectively).586

The sample of participants who were recruited into this study was also demographically and behaviourally similar to cannabis users who seek face-to-face treatment throughout
Australia (with the exception of being slightly older on average). That is, Project CAHL participants were: a) well educated and not typically disadvantaged in a socio-economic sense; b) mostly male (62%); c) a mean of 36 years of age; d) had been using cannabis for an average of 16 years; e) typically reported recently using cannabis as a mechanism to help cope with adverse emotions; and f) likely to have recently consulted with a health professional about their cannabis use prior to participation (93%). By way of comparison, face-to-face cannabis use treatment seekers among both intervention trials and community-based treatments: a) typically are well educated;\textsuperscript{159,300} b) are mostly male;\textsuperscript{12,159,300,916} c) have a mean age of 32 years in intervention trials;\textsuperscript{159,300} and a median age of 25 years among community treatments;\textsuperscript{12} d) have been using cannabis for approximately ten years;\textsuperscript{300,916} e) report mental health concerns,\textsuperscript{300,916,917} and frequently use cannabis to cope with adverse emotions;\textsuperscript{918,919} and f) typically report previous drug treatment service use\textsuperscript{782,918} (most commonly seeking counselling\textsuperscript{12}).

The similarity between telephone-based and face-to-face treatment seekers’ demographic profile and substance using behaviours suggest that the availability of cannabis treatment may be more important than the treatment modality. These results are consistent with three further studies regarding the perception of cannabis treatment by cannabis users.\textsuperscript{318,319,920} The first was a study comparing the treatment seeking characteristics of cannabis treatment seekers with cocaine and opioid treatment seekers. This study identified that cannabis users had lower rates of treatment exposure compared to cocaine or opioid treatment seekers, and were more likely to report that advertising with information regarding the availability of treatment was the most important factor influencing their decision to enter treatment.\textsuperscript{318} The second study compared the treatment outcomes reported by 197 clients of programs which received funding to improve accessibility to treatment with 122 clients of control programs.
which were not funded to do so. This study identified that participants of programs that had increased treatment opportunities reported greater treatment outcomes than participants of the control programs. The third study was conducted by the candidate on the facilitators of cannabis treatment as perceived by cannabis users in the community and in substance use treatments. This study found that cannabis users commonly report that improving the availability and accessibility of specific cannabis treatment services would facilitate treatment seeking.

Taken together, this body of work illustrates the importance of cannabis use interventions that emphasise availability and accessibility. As previously mentioned, this is a particular strength of telephone-based interventions, and these findings highlight the particular utility of a wide reaching telephone service.

*Predicting successful and unsuccessful cannabis-related outcomes*

Several baseline participant characteristics significantly predicted improved cannabis-related outcomes, suggesting that some individuals may be particularly successful in attempts to reduce cannabis use. Specifically, among intervention and control participants, those who reported socio-economic advantage, low levels of psychological distress, and high expectations of the CAHL intervention were statistically significantly more likely to report greater cannabis-related outcomes at 12 weeks. This finding is in line with recent study of the factors specific to the successful quitting of cannabis which found that individuals with above average education and low levels of stress were statistically significantly more likely to be successful in a reduction attempt. Unfortunately this study did not measure the participants’ expectations of treatment.

Research regarding other drug use treatment outcomes, however, has shown an

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vii This study was conducted by the candidate and, as it was part of a body of research which identified the possible benefits of a telephone-based cannabis intervention, it is also referenced in Appendix E.
association between greater outcomes and high treatment expectations,\textsuperscript{872, 873} and socio-economic advantage.\textsuperscript{700}

Further, among intervention participants it was found that being a young male with a high frequency of baseline cannabis use was statistically significantly associated with treatment drop out. This finding was consistent with longitudinal studies of individuals who have ever tried to reduce their cannabis use, which have found that continued use is associated with being male,\textsuperscript{56, 803} younger age,\textsuperscript{56, 803, 921} and a higher degree of use.\textsuperscript{57, 803, 921} However, across the literature examining predictors of substance use treatment retention and completion among adults,\textsuperscript{922} and adolescents,\textsuperscript{923} gender is not consistently found to be a significant predictor. As such, the predictive power of gender in regards to the CAHL trial attrition is difficult to explain. One possible explanation is that a variable associated with the reported predictors of gender, age and cannabis use may have driven the rates of attrition but was not measured in project CAHL. One such variable that has recently been recognized is that of social anxiety.\textsuperscript{181, 182} In a study of 174 cannabis users (43\% female) it was found that social anxiety among men and not women was statistically significantly associated with an increased number of cannabis-related problems and with using cannabis as a coping mechanism.\textsuperscript{182} As such, those with greater social anxiety may be more likely to drop out from treatment.

Unfortunately, this hypothesis remains to be tested.

Taken as a whole, this body of work suggests that cannabis interventions may increase their effectiveness and decrease rates of treatment attrition by avoiding a uniform approach with all participants. That is, cannabis interventions should address participants who present with high levels of psychological distress or social anxiety – particularly when these participants are young males from a disadvantaged socio-
economic background – by providing a more individualised intervention targeting psychosocial health. Unfortunately, in the cannabis intervention literature, with the notable exception of one recent intervention, co-morbid mental health concerns are not typically targeted. In this trial no significant difference in treatment outcomes was noted between a targeted and non-targeted cannabis intervention. As such, further research is required to determine how a particular intervention can best target psychosocial health and to what extent the participants may benefit from an individualised cannabis treatment.

The strengths of the Cannabis Assistance HelpLine intervention

The strengths of the CAHL intervention extend beyond its utility in engendering reductions in cannabis dependence severity and cannabis-related problems which lead to clinically significant improvement. The intervention was delivered with minimal additional costs by using an existing telephone service – the Cannabis Information and Helpline (CIH). Moreover, using the existing infrastructure and counsellor staff allowed for the intervention to be an extension of the CIH services and allowed for economy of scale. That is, existing staff (four counsellors) were trained to deliver the intervention from the central CIH location. Thus, it was economically feasible for the counsellors to operate both the CIH general service and the CAHL intervention. This meant that the intervention was sustainable at the completion of the current trial and continues to be available. This also meant that the counsellors delivering the intervention were experienced with assisting cannabis users. The counsellors had a counselling background and went on to receive training specific to the intervention over two days with weekly supervision. Thus, training, quality control, and the evaluation systems also were better managed in a single setting.
The participants of the CAHL intervention were recruited following their initial and unprompted call to the CIH. This meant that the included participants were not highly selected (16% of interested callers met exclusion criteria), and the participants’ demographic and substance use profile was found to be similar to cannabis treatment seekers in general. This finding had two important implications. First, the treatment outcomes reported by participants reflected “real-world” change and that the results were generalisable, as compared to clinical trials of interventions developed and conducted by research staff with participants selectively recruited from newspaper advertisements. Second, the CAHL intervention provides a means of addressing the problem with current treatments where relief from cannabis use disorder and other mental health concerns is limited to those who have access to local treatment facilities.\textsuperscript{326} That is, the CAHL intervention provides a service which is attractive to the general cannabis treatment seeker and is accessible to many individuals throughout Australia at minimal cost.

Project CAHL also demonstrated rigor in the evaluation of the CAHL intervention. First, few trials of face-to-face cannabis interventions have included measures of cannabis frequency, dependency severity and physical or mental health,\textsuperscript{478} and these measures were not included in the only previous telephone-based cannabis intervention trial. Second, in addition to these measures, Project CAHL addressed the participants’ treatment expectations and the working alliance formed during treatment – two factors common to many treatments that are thought to influence treatment outcomes. Analyses of these common factors did not suggest any significant influence on the reported treatment effect. Third, few intervention trials involving telephone-based services have included any description of intervention content or implementation. Finally, few intervention trials involving telephone-based services have recruited participants from
callers to a reactive helpline, as compared to the more common methods of using media advertisements or recruiting through face-to-face health services.

**Limitations of the Cannabis Assistance HelpLine intervention**

Some limitations should be considered when interpreting these results. First, time constraints and the low call rates to the CIH restricted recruitment and treatment attrition could have been reduced with a more intensive follow-up assessment protocol. As such, this study showed a loss to follow-up of 31% which may have resulted in a slight under-powering of longitudinal analyses. Although just under one third of participants who completed baseline measures did not complete both follow-up assessments, this figure was almost half that of the only other trial of a telephone-based cannabis intervention.\(^\text{488}\)

Second, the long term effectiveness of this intervention cannot be predicted by the short 12-week follow-up period afforded in this trial. The statistically significant treatment effect regarding clinical improvement at 12-week follow-up was promising, but it cannot be considered to demonstrate long-term continuation.

Third, analyses of certain variables should be interpreted with caution. First, missing data regarding cannabis dependence severity was not found to be missing completely at random. As such, analyses for this variable were managed by using the pooled results from multiple imputations of the existing data and the intervention effect on dependence should be treated with some caution. Second, the internal consistency of this variable, and the index of physical health-related quality of life (EQ-5D health scale) was questionable at baseline. As such, baseline comparisons for these variables should be interpreted with caution. Third, the participants were asked to describe their cannabis use motives at baseline and these responses were collapsed into categories without the
use of inter-rater reliability testing or an intensive coding technique such as open-coding from grounded theory. Thus, motives for cannabis use had untested internal validity.

Fourth, the treatment fidelity data was limited by a lack of validated measure and a small sample of sessions that were rated by both the candidate and the counsellor. Despite this, it was encouraging to observe that the average rating that was collected on the individual components of intervention delivery were typically above four out of five.

Fifth, as with many telephone-based tobacco intervention trials, this trial could not achieve complete blinding. The candidate conducted the follow-up assessments and was not blinded to treatment intervention. Participants were not blind to their allocation into the intervention or control group. The counsellors delivering the intervention, however, were partially blinded from random allocation. This was possible as most participants received the intervention (approximately two thirds of the control group entered the intervention following a three month delay).

Finally, given the nature of the telephone intervention (participants were located throughout Australia), biomedical validation data could not be collected to confirm the self-report data that was utilised, and the intervention participants were able to enter alternative treatment or use withdrawal medication during the trial. Given the disparate locations of participants, urinalysis was not practical and is not recommended for telephone trials. The use of concurrent treatments was common during Project CAHL (38% of participants at the time of recruitment and 65% at 12-week follow-up). Similarly, 38% of participants in Fernandes et al.’s telephone-based cannabis intervention trial reported accessing professional treatments at the time of recruitment. Unlike Fernandes et al.’s analysis strategy, Project CAHL controlled for
the effect of treatment seeking by including whether or not the participant used concurrent treatments (alternative professional help and the use of withdrawal medications) in the longitudinal analyses employed.

Conclusions and future work

In summary, along with Fernandes et al.’s initial evaluation of a telephone-based cannabis intervention, the results of this trial support the efficacy of a telephone-based treatment for cannabis use problems. The present study improved upon Fernandes et al.’s research by investigating a wider range of treatment outcomes and including a control for external treatments sought by participants. Results showed that a telephone-based cannabis use intervention can demonstrate comparable efficacy to face-to-face interventions while being delivered to a wider base of treatment seekers. As treatment seekers value treatments that are available and accessible, from a treatment matching perspective, the novel telephone-based intervention may be an ideal means of delivering effective treatment to treatment seekers.

Future studies would benefit by improving on the limitations to the methods of Project CAHL by 1) extending the follow-up period to determine the long term implications of telephone-based treatment; 2) enhancing recruitment through increasing radio and other media advertising (See Chapter Four for information regarding the impact of radio advertising on call rates to the CIH); 3) including multiple trained scorers to measure treatment fidelity and a validated measure of fidelity; 4) recruiting participants straight into the intervention and thus avoid any prior interaction with telephone counsellors; and 5) enhancing treatment adherence and retention to increase the number of intervention participants completing all counselling sessions and follow-up assessments. This would require greater attention to younger males and would be best accomplished
by including retention protocols such as those outlined by Scott,\textsuperscript{465} which have been shown to achieve 90% adherence to a large cannabis intervention trial (the CYT study) over 12 months.\textsuperscript{350}

Although adhering to treatment tended to increase gains on treatment outcomes, it was not conclusive that a four session telephone-intervention would be more efficacious than completing a single session intervention or an intervention of greater than four sessions. As such, enacting on the above five suggestions, future study ideally would compare the four session CAHL intervention with a single session telephone-based intervention and an intervention of greater duration with a particular focus on enhancing the participants’ self-efficacy to reduce cannabis use and developing a strong working alliance.

A broader discussion on telephone-based interventions and future work to assist individuals with reducing cannabis use follows in the next chapter which summarises the findings presented throughout this thesis and answers the eight research questions proposed in Chapter Three.
CHAPTER EIGHT: OVERALL DISCUSSION

THESIS OVERVIEW

This thesis aimed to determine the case for the establishment of a cannabis use helpline, the characteristics of callers and their experience with such a service, and whether it could deliver an efficacious cannabis intervention for those wishing to manage their cannabis use. For those with cannabis-related problems, the need for cannabis use treatments was discussed in Chapter One where a broad literature on the prevalence of cannabis use and the health effects of prolonged cannabis use was summarised. As discussed, frequent cannabis use and associated concerns are particularly common among young (adolescent and early adult) males.\(^4\)\(^\text{11}\)\(^\text{49}\) The most commonly studied concerns associated with cannabis use include physical health effects such as cardiovascular disease,\(^32\)\(^83\)\(^925\)\(^926\) respiratory impairment,\(^240\)\(^248\)\(^259\) cancer,\(^211\) an increased risk of fatal motor vehicle accident;\(^79\) and mental health effects, such as anxiety and psychosis,\(^20\)\(^24\)\(^28\)\(^927\) and a reduced short-term memory,\(^90\) attention span,\(^928\) and executive functioning.\(^91\) In addition, it has been estimated that approximately one in ten people who have ever used cannabis will become dependent, and when cannabis is used daily, this risk increases dramatically to one in two of those using at this level.\(^79\) Chapter One concluded that the typical cannabis user will not experience these concerns to the extent of needing treatment, however, a minority of users do seek professional treatment.\(^10\)

In support of this claim, census data from the US (the 2001 National Epidemiologic Survey on Alcohol and Related Conditions) and Australia (the 1997 National Survey of Mental Health and Wellbeing) showed that only 6.4% and 18.1% of dependent cannabis users sought substance use treatment in the 12 months prior to survey.\(^11\) As cannabis is...
the most frequently used illicit drug, this level of treatment seeking is such that cannabis is the most commonly reported illicit drug of concern in Australian and American drug treatment.

In order to establish the utility of available cannabis use interventions, a summary of the cannabis use intervention trials that have been published following an inaugural investigation by Stephens et al. in 1994 was presented in Chapter Two. A total of 28 randomised controlled trials, and six uncontrolled pilot studies of cannabis use interventions were discussed, with the greatest efficacy demonstrated by interventions that combined motivational enhancement therapy (MET) with cognitive behavioural therapy (CBT) and contingency management. Notably, only one study investigated the utility of the telephone in delivering a cannabis use intervention. This lone trial supported the use of the telephone, although translation of the results to practice was hampered by poor methodology. Chapter Two concluded that the telephone may provide an opportunity to deliver a MET and CBT cannabis use intervention to a wider population of treatment seekers compared to traditional face-to-face services, implying that further research is warranted.

In order to provide an overview of the use of telecommunication technology an initial literature review regarding the use of the telephone and how the technology has been applied to substance use treatments globally is presented in Chapter Three. Services addressing tobacco cessation were found to be the most abundant among telephone counselling research. This point was illustrated in several Cochrane review articles on tobacco cessation interventions which have shown that telephone-based tobacco use interventions can be efficacious, and cost-effective in comparison to face-to-face interventions. In contrast, research regarding the utility of telephone interventions
for illicit substance use concerns was found to be comparatively scarce. Research of telephone-based illicit substance use interventions outside of aftercare models was particularly limited. It was discussed that the introduction of a telephone-based substance use intervention could benefit from several factors particular to this delivery method. First, the professional does not need to be approached in their own office, giving treatment seekers greater personal space, reduced travel impediments, and greater flexibility, and therefore the freedom to maintain full time work. Second, anonymity can be preserved with the unlikely exception of voice recognition. Finally, the reach of a telephone-based service is greater than a face-to-face service and the ease of access may encourage clients whose motivation was low and would otherwise not make the effort to travel to a counselling centre.

Chapter Three concluded that the development of a telephone-based cannabis use intervention was warranted and described the primary aim of the thesis: to develop and evaluate a cannabis use intervention to be delivered by telephone.

Although no telephone-based cannabis use intervention had been developed in Australia, a national telephone service – the Cannabis Information and Helpline (CIH) – offered advice and links to self-help materials for individuals with cannabis use concerns. Thus, it was of interest to determine if the CIH was positioned in such a way that it could assist in the delivery of a telephone-based cannabis use intervention. As such, Chapter Four described an assessment of the CIH service and answered the first three research questions of the thesis:

1) How does the CIH operate?

2) Who calls the CIH and why do they call?

3) What happens during the calls to the CIH: do the callers receive information, counselling and/or referrals?
These questions were asked to establish the extent to which the CIH received calls from individuals requesting assistance in reducing their cannabis use and to identify how the CIH responded to these concerns. Chapter Five assessed the callers to the CIH service to answer three further research questions:

4) Are the callers to the CIH satisfied with their call?
5) Are callers given any information, advice and or referral that they utilise?
6) Are there any aspects of the call, or the caller, that may predict satisfaction with the call?

This body of work established that the CIH was an ideal platform for the delivery of a cannabis use intervention. Thus, Chapters Six and Seven discussed the development and evaluation of a telephone-based cannabis use intervention – namely, the Cannabis Assistance HelpLine (CAHL) – to be delivered by counsellors from the CIH. These chapters answered the final two research questions of the thesis regarding the efficacy of a telephone-based cannabis intervention:

7) Can a telephone-based treatment lead to a reduction in an individual’s cannabis use and improve physical and mental health? Do any treatment gains remain while controlling for any additional external support?
8) Is there any correlation between treatment gains and the treatment seeker’s demographic profile?

The results regarding these eight research questions are discussed in the next section, followed by a general discussion of the implications of the thesis findings and recommendations for future work.
Research Question 1: How does the CIH operate?

At the time of its inception in 2008, the CIH consisted of 14 staff members operating a free national service out of New South Wales, Australia. The CIH answered calls on at least two manned telephones for nine hours a day on six days per week. Telephone operators were required to have: a minimum of one year experience in telephone counselling, and a tertiary qualification in telephone counselling or equivalent (such as the TAFE awarded Certificate IV for telephone counselling [program code CHCAOD1C]), and a minimum of introductory drug and alcohol knowledge. As the CIH did not initiate calls it was of interest to determine if the centre had the capacity or interest to begin making calls to participants and deliver a cannabis use intervention.

Upon communication with the National Business Development Manager at Lifeline Australia, it was determined that the service had the capacity, and the staff were willing to attend training to deliver such an evidence-based intervention (T. Fox, personal communication, 23 October, 2008).

Research Question 2: Who calls the CIH and why do they call?

Chapter Four illustrated the findings of an investigation of the routine data collected by the CIH following each call received between January 2008 and December 2010. The data was kept in a database referred to as ‘CIH LIFE’. Excluding calls to the CIH that were not genuine (hoaxes, calls to the office by staff, abusive calls, etc.) a total of 5004 ‘genuine’ calls were received in the three year period. Thus, the CIH reported an average call rate of 32 genuine calls per week. This figure significantly increased to over one hundred calls per week during the peak of a radio advertising campaign – a call rate that was comparable to 57% of other mental health helpline services in
Australia. This campaign, however, was conducted at the considerable cost of $225,365 (AUD).

Three different types of CIH callers were identified in the CIH LIFE dataset. The largest group of callers were individuals calling about a concern they had regarding their own cannabis use (48% of calls). Smaller groups of callers were those calling in regards to another individual of concern (38% of calls), and those interested in cannabis-related information (13% of calls). Callers concerned about their own cannabis use were approximately five times more likely than callers with a simple information request, or with a concern regarding the cannabis use of another individual, to be male (62% compared to 29% and 24%, respectively) and several years younger (median age of 34 compared to 37 and 45 years, respectively). It was noted that, as the largest group of callers to the CIH were concerned about their own cannabis use, the service was well positioned to offer an intervention to assist callers to reduce their cannabis use.

**Research Question 3: Do the callers receive information, counselling and/or referrals?**

The average call duration to the CIH was 20 minutes. It was unusual for calls to the service to continue for one hour or more (2% of calls), although one quarter of calls continued for at least half an hour. During the calls, the counsellors reported most commonly listening, asking questions and reflecting on responses, and reported that callers were typically then able to identify their issues and identify an option to pursue. The counsellors also reported that almost one third of the genuine calls to the CIH involved at least one referral being made for further assistance (typically to other drug or alcohol services). These findings suggested that the CIH service did not commonly offer an intensive intervention when receiving a typical call. Thus, the service was well
positioned to begin delivering an intervention, but that specific training regarding the
delivery of an intensive intervention was necessary.

**Research Question 4: Are the callers to the CIH satisfied with their call?**

Chapter Five detailed the results from a survey of 200 individuals who called the CIH
that was designed to establish the callers’ satisfaction with the CIH service. The surveys
were conducted one week following an individual’s call to the CIH in order to allow
time for any requested printed materials to be delivered. The callers’ satisfaction was of
interest to determine the extent to which the CIH service was capable of addressing the
callers’ cannabis-related concerns. As addressing cannabis-related concerns is
fundamental to any cannabis use intervention, this information also supported the
appropriateness of the CIH counsellors being chosen to deliver such an intervention.

The participants reported very high satisfaction with the service. That is, participants
reported an average Client Satisfaction Questionnaire score of 28.19 ($SD=4.34,$
*median*=29, *range*=11-32) out of a possible 32, with one in five (22%) rating the CIH
with the highest satisfaction score. Callers to the CIH were not only satisfied with their
call, but reported a preference for calling the CIH to alternative forms of professional
help. That is, half of participants were aware of alternative forms of professional help
for their cannabis use concerns, and three quarters of this subsample indicated that they
preferred to contact the CIH over the alternatives.

**Research Question 5: Are callers given any information, advice and or referral
that they utilise?**

The satisfaction survey also questioned the CIH callers as to the helpfulness and impact
of their call to the CIH. These questions were of interest to determine if the information
or advice received was utilised in a meaningful way by the callers. Identifying that the CIH callers use the information provided in a meaningful way would support the utility of providing a cannabis use intervention for those callers interested in receiving assistance to reduce cannabis use.

The satisfaction survey data demonstrated that the service was thought to be helpful (with an average rating of 8.14 out of 10) and had an impact on a range of cannabis-related concerns (with an average rating of 7.02 out of 10). Although there were no statistically significant differences between helpfulness ratings, the service was rated to be least helpful and had the least impact in assisting callers to reduce their cannabis use. The participants rated the helpfulness of the CIH in this regard at a mean of 7.15, and the impact of the call at a mean rating of 5.74 (each out of 10). In addition, fewer than half of participants (40%) had made a ‘plan of action’ with the counsellor during the call. Finally, fewer than half of the participants (42%) were offered a referral to alternative cannabis treatments during the call, and for those offered a referral ($n=83$), most (57%) had not made contact in the week after their call.

Taken together, these results suggested that the CIH service, although satisfying to callers, was least helpful in assisting callers to reduce their cannabis use. As such, the development of a cannabis use intervention was thought to compliment the reactive service with minimal redundancy. These results, however, also indicated that the CIH counsellors would benefit from additional specific training on MET and CBT techniques to improve the efficacy of delivering advice regarding cannabis use reductions.
Research Question 6: What aspects of the call, or the caller, predict satisfaction with the call?

Given the association between increased satisfaction with substance use interventions and greater treatment retention and outcomes, it was of interest to determine which aspects of the call content or the caller profile might increase satisfaction. As such, Chapter Five detailed a regression analysis conducted with the CIH satisfaction survey data to determine which aspects of the call (including ease of access, counsellor empathy, helpfulness, attention to caller needs, call duration, the number of counselling components utilised during the call, and the call outcomes), and which aspects of the caller (including age, gender, socio-economic status, knowledge of alternative treatments, or whether the caller was calling about their own or another’s cannabis use), significantly predicted levels of satisfaction with the telephone service. The results highlighted that factors relating to the counsellor, and not caller characteristics, were associated with satisfaction. More specifically, calls which involved CIH counsellors who were empathic and warm toward the caller, and who ensured that the caller had no unmet needs, were rated with the highest satisfaction.

These results suggested that a telephone-based cannabis use intervention would be more likely to be perceived as satisfying (and therefore treatment outcomes may be more positive) if the counsellors were informed to pay particular attention to the participants’ specific needs, and developed a working alliance with callers.
Research Question 7: Can a telephone-based treatment lead to a reduction in cannabis use and improvement in physical and mental health, and do these treatment gains remain while controlling for any additional external support?

The development of the Cannabis Assistance Helpline (CAHL) intervention was described in Chapter Six. The CAHL intervention was based on two intervention styles with the largest evidence base from previous trials of cannabis treatments - a combination of motivational enhancement therapy (MET) and cognitive behavioural therapy (CBT). The intervention was designed to be four, one-hour sessions, delivered weekly. The first two sessions were based in MET to enhance and solidify readiness to change, while the remaining two sessions moved into a focus on CBT in order to aid in the active process of making change. A focus on establishing a strong working alliance was made during the initial stages of each session. Each session was flexible to the needs of the participant depending on their success or failure in reducing their cannabis use. In addition, the sessions were supplemented with self-help materials taken from a pre-existing free booklet available through the National Cannabis Prevention and Information Centre website (available at http://ncpic.org.au/static/pdfs/training-and-workshops/quitting-cannabis-workbook.pdf). This booklet was chosen as it was originally developed based on the findings of the same face-to-face CBT-based intervention which was used as a foundation for the CAHL intervention. Following the development of the intervention, the counsellors at the CIH were trained to deliver the intervention and were provided with a treatment manual (see Appendix C).

In order to evaluate the CAHL intervention, an RCT was conducted (referred to as Project CAHL). Chapter Six detailed the methods of Project CAHL. A total sample of
160 callers to the CIH who were interested in receiving assistance to reduce their cannabis use were included in Project CAHL and randomly allocated to the intervention group (n=79) or a wait-list control group (n=81). Participants’ cannabis use and related problems, as well as physical and mental health, were assessed by telephone prior to allocation (baseline) and again four and 12 weeks later.

The results of Project CAHL were discussed in Chapter Seven. As hypothesised, at four- and 12-week assessments, compared to the control group, intervention participants reported greater reductions in cannabis-related problems, and cannabis dependence severity, and in the number of hours the participants were ‘high’ during a typical day when cannabis was used. Lending from Stephens et al.’s definition of clinical significance,160 “improvement” was defined as greater than 50% reduction in cannabis use and no report of cannabis-related problems at the 12-week assessment. Using this definition, intervention participants were statistically significantly more likely to report improvement compared to control participants at four- (22% improved compared to 7%) and 12-week follow-up (39% improved compared to 20%). Contrary to hypotheses, the intervention group did not report greater reductions than the control group in the quantity of cannabis smoked on a typical day, other substance use (90 day frequency), or improvements on measures of physical or mental health. Participants were encouraged to access additional external professional help in the final CAHL session, and the use of external treatments or medication during trial participation was controlled for in the data analysis. Indeed, many participants did utilise external treatments or withdrawal medications across the trial duration (38% of participants at baseline were using medications, while at four- and 12-week follow-up over half of participants had accessed treatment or were using medications; 60% and 55%, respectively).
As was discussed, the treatment’s failure to improve physical or mental health over a 12-week period to a greater extent than lack of intervention is not uncommon.\textsuperscript{342, 352, 353} Although three intervention trials have found statistically significant between-group treatment interactions regarding measures of psychiatric distress,\textsuperscript{356, 345, 361} these trials included three separate measures of psychiatric distress (a specific state-based anxiety measure,\textsuperscript{345} a broad measure of psychopathology symptoms,\textsuperscript{356} and a specific measure of adolescent externalising and internalising behaviours\textsuperscript{361}). Project CAHL included broad measures of psychological functioning (the Kessler-10\textsuperscript{871, 886} and the EQ-5D physical health scale and quality of life index\textsuperscript{930}) and did not detect a statistically significant relationship between intervention participation and improved outcomes. Specifically, at the 12-week follow-up, the total sample reported an average Kessler-10 score of 19.5 out of 50 (58\% were considered to be in a state of moderate distress), an average physical health score of 72.1 out of 100, and an average quality of life index score of 0.84 out of 1. Normative data was available for both the Kessler-10 and the EQ 5-D index. A smaller proportion of the general population, and recent cannabis users, reported being in a state of moderate distress (30\% and 43\%).\textsuperscript{49} The quality of life index was similar to scores reported by the general community in Australia (0.85) and above that of inpatients and outpatients of Melbourne hospitals (0.70 and 0.53, respectively).\textsuperscript{915}

The lack of intervention effect may be unsurprising as the CAHL intervention did not focus on the participants’ physical or mental health, but rather concurrent improvements in these domains were expected following a reduction in cannabis use. In addition, the chosen measures of physical and mental health were broad measures designed to identify a global change in psychosocial functioning and may not have the required sensitivity to detect small changes in specific constructs of well-being.
The proportion of Project CAHL participants reporting clinically meaningful improvement were compared to a previous RCT of two cannabis use interventions which utilised the same definition of improvement and also included a follow-up assessment 12 weeks from baseline.\textsuperscript{160} Although there were significant differences in the methods of these interventions and the CAHL intervention, the participant groups were similar in terms of demographics and substance use profile. Participants of the comparison interventions, a relapse prevention-based intervention and a social support-based intervention (each were ten group-based sessions delivered over 12 weeks), reported comparatively greater percentages of participants attaining a meaningful improvement than did the CAHL intervention participants (61\% and 54\% compared with 39\%, respectively).

In terms of the percentage of days abstinent in the month prior to the 12-week assessment, however, results were comparable to the most comprehensive and intensive trial of a MET+CBT-based cannabis treatment - the Marijuana Treatment Project Research Group (MTPRG) trial.\textsuperscript{345} This nine session intervention was delivered face-to-face over 12 weeks to a group of participants with a similar demographic and substance using profile as Project CAHL participants. At four months post-baseline, the MTPRG trial participants reported abstinence on 64\% of 90 days prior to assessment (verified by urinalysis).\textsuperscript{345} In comparison, the CAHL intervention participants reported an increase in abstinent days from 24\% to 74\% of the 28 days prior to baseline and 12-week assessment, respectively. Thus, the intervention resulted in somewhat comparable treatment gains to a more intensive face-to-face treatment of longer duration (the CAHL intervention was delivered over four one-hour sessions compared to 9 one-hour sessions for the MTPRG trial).\textsuperscript{345}
These comparisons were favourable mainly for participants living in socio-economic advantage who reported high physical and mental health at baseline and a greater confidence to avoid use at the time of the four-week assessment. Notably, treatment adherence was not statistically significantly associated with treatment outcomes. A non-significant trend was noted however, and intervention completers reported greater reductions in treatment outcomes (particularly reductions in alcohol and tobacco use) compared to partial completers. This lack of statistical significance was somewhat surprising as the final CAHL session was unique in that it focused on increasing the participants’ self-efficacy and confidence to avoid cannabis use in the absence of further treatment. Notably, the lack of significance in comparisons regarding treatment outcomes between those completing four sessions and those completing one to three sessions was likely to reflect a lack of statistical power due to a small sample size in each group. This absence of a statistically significant effect of treatment adherence supports previous research which has suggested that attending one treatment session may be as important as complete treatment adherence in predicting treatment outcomes.\textsuperscript{343, 352, 361} Alternatively, this finding was not consistent with other cannabis intervention trials which found that treatment completers reported greater treatment outcomes than non-completers.\textsuperscript{342, 354-356, 894}

**Research Question 8: Is there any correlation between treatment gains and the treatment seeker’s demographic profile?**

Project CAHL participants were mostly adult males (62%), aged in their mid-thirties, typically with no socio-economic advantage, or disadvantage, relative to the average Australian adult. This demographic profile was similar to that of face-to-face cannabis treatment seekers who are typically well educated,\textsuperscript{159, 300} mostly male,\textsuperscript{12, 159, 300} and
have a median age of 32 years. No statistically significant relationships were found between any measures of demographic profile and treatment outcomes with the exception of socio-economic status. Participants who reported a greater socio-economic advantage were found to report greater reductions in the number of hours spent high on days of cannabis use. Notably, socio-economic advantage has been consistently shown to be associated with greater substance use treatment outcomes in the short term, with the strength of the association decreasing in the long-term (12-month follow-up). The lack of further statistically significant relationships between demographics and treatment outcomes was consistent with previous research on face-to-face substance use treatments which suggests that these treatments appear to be equally effective in reducing substance use for both genders (although males may have worse outcomes relating to criminal behaviours following treatment). Research on telephone-based tobacco interventions, however, is at odds with this finding. According to a meta-analysis of telephone-based tobacco cessation interventions, male participants and younger participants typically reported better treatment outcomes compared with females, and older participants. Importantly, research regarding gender differences in treatment outcomes is scarce, and the relationship between gender and treatment outcomes is not well described. Indeed, some authors argue that gender differences in outcomes are largely limited to areas of psychosocial functioning, or may be better explained by length of stay in treatment. Although the participants’ demographic profile did not explain treatment outcomes, results demonstrated that the participants’ confidence in the treatment, their self-confidence to avoid cannabis use, and their ability to form a working alliance with the counsellors, each significantly predicted the number of abstinent days reported in the month prior to the 12-week assessment. That is, participants who expected the
intervention to be successful, participants who perceived the working alliance formed during the intervention was strong, and those who increased their confidence to avoid cannabis use each reported statistically significantly less days of cannabis use at final follow up. These results were consistent with previous studies regarding treatment expectations of mental health interventions, the importance of a participants’ confidence in making changes to substance use in general, and cannabis use specifically, and the quality working alliance in substance use treatments. In a more detailed mediation analysis, the participants’ confidence to avoid use (as measured at the four-week assessment) was shown to explain 71% of the relationship between participant group allocation and the number of reported days of cannabis abstinence at 12 weeks. Notably, the relationship between confidence to avoid cannabis use and abstinent days at 12 weeks remained statistically significant when controlling for change in cannabis use frequency from baseline to four weeks. As such, participants in the intervention group reported a greater number of days abstinent from cannabis than control participants, largely because participation in the intervention resulted in a statistically significant increase in their confidence to avoid use.

LESSONS LEARNED AND FUTURE WORK

The CIH provides a unique service to Australians with cannabis-related concerns and the studies described in the thesis provide an initial investigation of a cannabis specific helpline. Further, Project CAHL provides an initial investigation of the effects of a telephone-based cannabis intervention relating to cannabis use dependence and related problems disorder. As such, some important lessons from the evaluation of both the CIH, and the CAHL intervention, are discussed here.
The applicability of telephone services for substance use related concerns

The treatment seekers calling the CIH and participating in Project CAHL were demographically similar to face-to-face treatment seekers. However, no statistically significant relationship between the demographic characteristics of callers and any associated report of satisfaction or positive treatment outcomes was found (with the exception of an association between socio-economic status and the number of hours the participants spent high when using cannabis at four and 12 weeks). This was not consistent with previous research highlighting the importance of demographic characteristics and reports of satisfaction in face-to-face treatments. That is, younger individuals tend to report lower satisfaction with substance use treatment than older individuals, and women may report lower satisfaction than men, particularly for services that fail to attend to their need for child care services, or assistance with pregnancy and parenting.

One explanation of the lack of predictive significance by demographic details is that the elements underlying age and gender that impact on client satisfaction with face-to-face services (such as increased responsibilities with age, or an unbalanced need for child care services) may be overcome by the benefits particular to a telephone service (such as increased accessibility and anonymity). That is, the telephone may offer a substance use service that is more broadly applicable to individuals of any demographic throughout Australia compared to face-to-face services. Unfortunately, further work is required to explore this speculation. Although further evidence depicting the generalised applicability of telephone services to all demographics and locations is needed, it is clear that telephone services can provide greater accessibility for treatment seekers that is far-reaching compared with face-to-face services that are limited by their
location. This may be particularly the case for individuals who believe accessing face-to-face treatment would invoke greater stigma compared with a telephone-based service which may offer greater anonymity.

**Call duration or treatment length – does it matter?**

The finding that the call duration and that the number of different components of counselling were not reported to be statistically significantly associated with satisfaction by CIH callers requires further explanation. Previous research on face-to-face substance use treatment services has shown that as the number of treatment sessions increased and the length of treatment delivery increased, satisfaction with the services significantly increased. Given the high satisfaction of the majority of callers to the CIH and the short duration of the majority of calls, it may be that the concerns of CIH callers were all attended to in a short amount of time, or callers were not disheartened when confronted with a need to call the service back given the ease of doing so. This explanation supports the general effectiveness of telephone interventions; however, further work that manipulates the duration of call response and uses a validated measure of the call content and counsellor interactions is required to support this view. Similarly, the finding that treatment adherence was not statistically significantly associated with treatment outcomes also requires further exploration. This result was unexpected, although three other cannabis intervention trials have reported a lack of statistically significant treatment adherence effect. The trial results and these three studies were at odds with four other trials which have reported a significant relationship between adherence and outcome. Three possible explanations for this result require further testing. First, the study lacked statistical power to detect small differences in treatment outcomes between partial completers and treatment...
completers as few partial completers attended the follow-up assessments. As such, future study should include a larger sample size to adequately power these statistical comparisons. Second, it could be that participants who did not complete treatment ended the intervention early due to the feeling that the number of sessions that were attended was right for them. This explanation is consistent with research that highlights the importance of matching the duration and intensity of treatments with the client’s needs. Third, it could be that only one intervention session was required to effect change and that complete treatment adherence to multiple intervention sessions is not required. This explanation is consistent with the positive treatment effect reported by a single-session telephone-based cannabis intervention.

Comparing the CAHL intervention with telephone-based interventions of different durations will ensure that only those services that are needed are provided. In this way, the provision of long-term treatment is avoided when brief short-term treatment may be more appropriate, and vice versa. As such, future work is warranted to determine if a single session intervention that includes an emphasis on the participants’ confidence to avoid cannabis in the absence of further treatment results in comparable treatment outcomes to the CAHL intervention. Similarly, treatment outcomes may be greater for an extended version of the CAHL intervention in which participants are given more time to enhance their coping skills and cannabis avoidance behaviours. Consistent with this notion are seven cannabis intervention trials which have included a relatively intense intervention (of twelve or more treatment sessions) and compared treatment outcomes with a less intense intervention showing a small but positive treatment effect size, and three additional trials showing a moderate to large treatment effect size.

332, 337, 343, 349, 350, 352, 361

333, 348, 353


**Improving on the Cannabis Assistance HelpLine**

This thesis improved upon the single previous trial of a telephone-based cannabis use intervention\(^488\) by investigating a wider range of treatment outcomes and including a control for external treatments sought by participants. Although favourable results were reported, and the telephone intervention demonstrated somewhat comparable efficacy to face-to-face interventions, future work is needed to attend to the limitations of Project CAHL. In particular, this future work would benefit by the following five suggestions.

First, future intervention trials should include a longer follow-up period to determine the long term implications of telephone-based treatment. Project CAHL was limited to a 12-week assessment due to time limitations, however, as the majority of individuals achieving two weeks of continuous abstinence during outpatient treatments are likely to relapse to cannabis use within six months,\(^477\) a minimal follow up assessment period of six months (24 weeks) is suggested. As demonstrated in the CYT study, to maximise trial adherence a participant follow-up protocol such as the ‘Engagement, Verification, Maintenance and Confirmation’ protocol\(^465\) should be used.

Second, enhance participant recruitment by increasing radio and other media advertising at the time of recruitment. As discussed in Chapter Four, the call rate to the CIH increased dramatically following a radio advertising campaign, a finding documented by other tobacco specific helplines in England,\(^588\) and Australia.\(^587, 673\)

Third, include multiple trained scorers to measure treatment fidelity and a validated measure. Such rigorous fidelity monitoring was not possible in Project CAHL due to limited resources and a single coordinator. Despite this, the most rigorous level of fidelity monitoring is recommended\(^937\) as the experience of individual treatment providers varies,\(^938\) and ensuring adherence to, and competence of, the treatment
delivery is likely to improve outcomes.\textsuperscript{439, 939} Although this level of monitoring was not possible in Project CAHL, a fidelity measure specific to CBT and MI combined interventions was recently developed and ideally would be used in future research.\textsuperscript{861}

Fourth, participants ideally should be recruited into the intervention via an external agent so as to avoid any prior interaction with telephone counsellors. In Project CAHL the participants were recruited into the trial following a call to the CIH. During this call the future participants were exposed to varying levels of counselling prior to participation. Thus, participants who went on to be randomised into the control group were previously exposed to counselling from the CIH, meaning that the experimental contrast was reduced. Recruiting from external sources would ensure a minimal contact unbiased control group.

Finally, future treatment should include a component that attends to participants’ physical and mental health and specific measures of physical and mental health constructs. The Project CAHL participant groups both reported statistically significant improvement in these areas from baseline to 12-week follow-up, although these improvements were not significantly different between groups. This result may have been found due to one of three reasons: 1) it reflected the failure of the CAHL intervention to adequately attend to the participants’ physical or mental health, and improvements were found due to the below average physical and mental health of the recruited participants and a subsequent regression toward the mean, or 2) a positive response was shown following the participants’ initial call to the CIH (in which all participants were recruited into the study), or 3) the CAHL intervention may have improved the participants’ physical or mental health, but the follow-up assessment lacked a specific measure able to identify between-group differences.
The importance of including both an intervention which attends to the participants’ mental health, and a specific measure of mental health outcomes, was also highlighted by a recent cannabis intervention trial by Hoch et al. In this small trial \((n=97)\) two MET+CBT cannabis interventions were designed: one with a component to attend to the participants’ psychosocial health, and one without this component. Both interventions reported promising reductions in cannabis use frequency, as well as improvements identified by a broad measure of psychosocial functioning, compared with a delayed treatment control condition. These treatment outcomes, however, were not found to be statistically significantly different between intervention groups. Unfortunately, like Project CAHL, this trial did not include a specific measure of psychosocial outcomes which may have had adequate sensitivity to identify the expected difference in outcomes between groups. As such, to further the understanding of the effect of a cannabis intervention on psychosocial health outcomes, future research would benefit by including an adequately powered trial which includes both an intervention component designed to attend to psychosocial health as well as a specific measure to identify these outcomes.

**Strengths of the Cannabis Assistance HelpLine intervention**

The CAHL intervention engendered reductions in cannabis dependence severity and cannabis-related problems and promoted clinically significant improvement. Importantly, these reductions were achieved in what can be perceived as a ‘real-world’ setting. That is, the intervention was delivered by existing staff from the CIH to a group of participants who called the CIH after experiencing sufficient concern regarding their cannabis use to do so. In comparison, an intervention delivered in a contrived setting would be conducted by highly skilled and qualified research staff with a highly selective
group of participants, intensively screened for any complicating mental health or other concerns, and motivated by seeing an advertisement regarding the research trial where financial incentives may be offered. An important benefit of using a real-world setting is that the CAHL intervention can operate outside of the efficacy trial and continue to be conducted by CIH staff with future callers to the CIH. The continued accessibility of this intervention is an important first step in addressing the current limitation of treatment services to assist only those within their immediate vicinity, and the gap between treatment research and its implementation. In addition, the intervention was produced with minimal costs by utilising the existing infrastructure of the helpline and its staff, and the evaluation systems and supervision of counsellors was stringently managed and standardised in a single location.

The methods used in evaluating the CAHL intervention were among the most rigorous of any face-to-face cannabis treatment trial. First, few previous face-to-face cannabis intervention trials have included measures of cannabis frequency, dependency severity and psychosocial functioning. In addition, these measures were not included in the only previous telephone-based cannabis intervention trial. Second, the treatment effect was supported by an analysis strategy which included several factors thought to predict treatment outcomes. Specifically, Project CAHL assessed the participants’ treatment expectations and the working alliance formed during treatment, and controlled for the use of concurrent external cannabis treatments. As such, the data analysis strategy validated the CAHL intervention effect and was able to show that intervention participation was a stronger predictor of outcome compared to having high treatment expectations, a strong working alliance with the counsellors, and making use of external treatments.
Finally, as the CAHL intervention participants were shown to reflect a similar demographic and substance use profile of cannabis treatment seekers in general, the positive treatment outcomes reported by these participants can be considered broadly generalisable. The applicability of the CAHL intervention and the novelty of its telephone-based delivery places the intervention among a handful of cannabis interventions that are capable of assisting individuals anywhere throughout Australia with their cannabis use concerns from a single location.\textsuperscript{484-487, 491, 544} In addition, as an increasing number of individuals have access to smartphones; the telephone-based CAHL intervention could be paired with a complimentary smartphone application. That is, the intervention could be augmented to include a mobile application to assist participants with monitoring their use and deliver informational and motivational messages between counselling sessions. Indeed, a pilot study of a mobile phone messaging-based cannabis intervention has demonstrated participant satisfaction ($n=12$) with informational messaging to assist with cannabis use reductions.\textsuperscript{544}

**Limitations of the Cannabis Assistance HelpLine intervention**

Some limitations should be considered when interpreting the results of Project CAHL. Firstly, time constraints, a lack of project research staff, and the low call rates to the CIH restricted recruitment and following loss to follow-up, the sample size was small. Importantly, the final sample size of participants completing the 12-week follow-up ($n=110$) was adequate to power the between-group comparisons regarding clinically meaningful improvement. In addition, the loss to follow-up (31\% of baseline participants were lost to follow-up) was within an acceptable range of attrition,\textsuperscript{473} and was half the attrition rate reported by the only other trial of a telephone-based cannabis intervention.\textsuperscript{488}
Secondly, the long term effectiveness of this intervention cannot be predicted by the 12-week follow-up period afforded in this trial. Fortunately, several face-to-face cannabis interventions have included a long term follow-up (at least 12 months). Of these trials, however, few have reported a statistically significant between-group treatment effect over this time. Notably, it is not unusual when individuals attempt to reduce their cannabis use that multiple phases of professional assistance are necessary due to frequent relapse. As such, the accessibility and the positive short-term treatment outcomes of the CAHL intervention may appeal to a group of individuals prone to relapse who can call the service on multiple occasions, particularly when positive long term outcomes are unlikely from a single episode of treatment.

Although Project CAHL is among the most rigorous evaluation of any telephone-based substance use intervention to date, the evaluation methods were not without some limitations. First, the treatment fidelity data was limited by a small sample of sessions that were rated by both the candidate and the counsellor. Despite this there was no indication that the treatment was not delivered as intended as all fidelity ratings were high, and no concerns were reported by the counsellors during the weekly supervision meetings. Second, Project CAHL could not achieve complete blinding. Although blinding is advised to reduce bias in treatment outcomes, this ideal is known to be difficult to achieve in behavioural intervention trials, and telephone interventions in particular. This was especially the case for Project CAHL which was developed and evaluated primarily by the candidate alone (under supervision). Finally, given the disparate location of participants, urinalysis could not be used to validate self-report and the participants were able to access concurrent treatment during participation in the trial. In previous telephone-based trials of tobacco cessation interventions, urinalysis has not
been recommended due to a lack of direct control to prevent sample tampering. In addition, unlike Fernandes et al.’s trial of a telephone-based cannabis intervention, the present evaluation was able to control for the use of concurrent treatments (professional help or withdrawal medication) by including a variable in the longitudinal analyses employed indicating whether or not the participant accessed such assistance during the trial.

**CONCLUSIONS**

This thesis has argued that a telephone-based cannabis intervention to assist problematic users to reduce their use is warranted and can be efficacious. Historically, the use of the telephone helpline has been limited to assisting with mental health crisis, and to a lesser extent, assisting with tobacco smoking cessation. Only a handful of trials have focused on assisting with illicit substance use concerns. This is surprising as many countries have existing telephone helpline services that cater for illicit substance use concerns. If the findings from this thesis are translatable, these services are likely to be ideal candidates to begin delivering brief substance use interventions. A number of factors inherent to the use of the telephone make the prospect of a substance use intervention particularly appealing, specifically for cannabis treatment seekers. That is, cannabis treatment seekers typically believe accessing treatment would invoke stigma or be difficult due to treatment location or wait lists. A cannabis use telephone helpline addresses these barriers by providing anonymous counselling, as well as information and feedback that is individualized, easily accessible and maintains client confidentiality.

The telephone intervention developed and evaluated in this thesis was referred to as the Cannabis Assistance HelpLine (CAHL). Results from a randomised controlled trial
showed that the intervention group ($n=79$), compared to a wait-list control group ($n=81$), reported statistically significantly reduced cannabis-related problems and cannabis dependency at four and 12 weeks post baseline. Among the intervention participants, no statistically significant differences in outcomes were noted between those who completed one to three intervention sessions and those completing the four intervention sessions. The cannabis-related outcomes at 12 weeks reported by intervention participants were comparable to the brief treatments for cannabis dependence conducted by the Marijuana Treatment Project Research Group, and lending from Stephen et al.’s definition, the outcomes were considered to represent clinically meaningful improvement for one in three intervention participants.

Future work is warranted to compare the CAHL intervention to a refined one session intervention and an extended intervention of more than four sessions (ideally more than 12 sessions) to determine how to most cost-effectively deliver cannabis treatment. This work would benefit by including a sample size large enough to adequately power outcome analyses, multiple scorers of treatment fidelity, use of a validated treatment fidelity instrument, a long-term follow-up assessment (ideally at least 12 months), and using a protocol aimed at improving trial adherence (such as the ‘Engagement, Verification, Maintenance and Confirmation’ model). Finally, the intervention could be augmented to use new online and/or smart phone technologies to bridge sessions and monitor cannabis-related outcomes.

By providing evidence of the need for cannabis use treatment, and the benefits of providing this treatment by telephone, this thesis supports the telephone as an efficacious model of service delivery. The CAHL intervention was developed at minimal cost with the existing resources of the CIH and represents a sustainable
treatment model that was easily accessible to a widespread audience of treatment seekers. Further, as the service can be delivered from a single location, quality control and the standardisation of its service is better managed than with multiple service locations. Moreover, as the individuals accessing the CIH for assistance with their cannabis use were representative of Australian cannabis treatment seekers in general, the positive treatment gains also were considered to be generalisable.
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APPENDICES

APPENDIX A:

THE CANNABIS INFORMATION AND HELPLINE CALL SHEET
<table>
<thead>
<tr>
<th>Cannabis Helpline</th>
<th>1800 30 40 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counsellor:</td>
<td>LIFE Call ID:</td>
</tr>
<tr>
<td>Phone Call ID:</td>
<td></td>
</tr>
<tr>
<td>Call Start Date:</td>
<td></td>
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<td>Call Start Time:</td>
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<tr>
<td>Call End Time:</td>
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<td>Call Duration:</td>
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<tr>
<td>Known Caller:</td>
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<td>(enter details,</td>
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<td>including last</td>
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<td>four digits of</td>
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<tr>
<td>caller's phone</td>
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<tr>
<td>number)</td>
<td></td>
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<tr>
<td>Call Type:</td>
<td></td>
</tr>
<tr>
<td>☐ Calls for Office – General Lifeline</td>
<td></td>
</tr>
<tr>
<td>☐ Counselling</td>
<td></td>
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<tr>
<td>☐ Hang Up</td>
<td></td>
</tr>
<tr>
<td>☐ Information (data)</td>
<td></td>
</tr>
<tr>
<td>☐ Information (no data)</td>
<td></td>
</tr>
<tr>
<td>☐ Nuisance / Abuse / Hoax</td>
<td></td>
</tr>
<tr>
<td>☐ Other Non-Counselling</td>
<td></td>
</tr>
<tr>
<td>☐ Sexual Harassment</td>
<td></td>
</tr>
<tr>
<td>☐ Silent Call / Wrong Number</td>
<td></td>
</tr>
<tr>
<td>☐ Thanks / Appreciation</td>
<td></td>
</tr>
</tbody>
</table>

If the Call Type is Counselling, Information (data), Nuisance / Abuse / Hoax or Sexual Harassment, please complete the rest of this form. If it is another Call Type, no further information is required.

<table>
<thead>
<tr>
<th>1. What was your age last birthday? (years)</th>
<th>2. What postcode are you calling from?</th>
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</thead>
<tbody>
<tr>
<td>3. Sex of caller?</td>
<td>4. What is your current marital status?</td>
</tr>
<tr>
<td>☐ Unable to collect</td>
<td>☐ Unable to collect</td>
</tr>
<tr>
<td>☐ Male</td>
<td>☐ Never married</td>
</tr>
<tr>
<td>☐ Female</td>
<td>☐ Widowed</td>
</tr>
<tr>
<td>☐ Indeterminate</td>
<td>☐ Divorced</td>
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<tr>
<td></td>
<td>☐ Separated</td>
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<tr>
<td></td>
<td>☐ Married (registered and defacto)</td>
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<th>5. What is your current employment status?</th>
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<tbody>
<tr>
<td>☐ Unable to collect</td>
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<tr>
<td>☐ Employed</td>
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<tr>
<td>☐ Unemployed</td>
</tr>
<tr>
<td>☐ Not in the labour force</td>
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<tr>
<th>6. What is your current living arrangement?</th>
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<tbody>
<tr>
<td>☐ Unable to collect</td>
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<tr>
<td>☐ Lives alone</td>
</tr>
<tr>
<td>☐ Lives with family</td>
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<tr>
<td>☐ Lives with others</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>7. Are you of Aboriginal or Torres Strait Islander origin?</th>
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</thead>
<tbody>
<tr>
<td>☐ Unable to collect</td>
</tr>
<tr>
<td>☐ No</td>
</tr>
<tr>
<td>☐ Aboriginal</td>
</tr>
<tr>
<td>☐ Torres Strait Islander</td>
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<table>
<thead>
<tr>
<th>8. Do you speak a language other than English at home?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Unable to collect</td>
</tr>
<tr>
<td>☐ No (English only)</td>
</tr>
<tr>
<td>☐ Italian</td>
</tr>
<tr>
<td>☐ Greek</td>
</tr>
<tr>
<td>☐ Cantonese</td>
</tr>
<tr>
<td>☐ Mandarin</td>
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<tr>
<td>☐ Arabic</td>
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<tr>
<td>☐ Vietnamese</td>
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<tr>
<td>☐ German</td>
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<tr>
<td>☐ Spanish</td>
</tr>
<tr>
<td>☐ Tagalog (Filipino)</td>
</tr>
<tr>
<td>☐ Other, please specify:</td>
</tr>
</tbody>
</table>
Issues

Please indicate issue 1 and issue 2 below, by placing a 1 and a 2 against the relevant issues. If only one issue is evident please tick ‘No second issue’ below.

Notes:

1. At least one issue must be selected from the Cannabis Use category.

2. Suicide Related* must be selected as one Issue Category if the caller is dealing with 1) their own suicidal thoughts or acts, 2) someone else’s suicidal thoughts or acts or 3) the impact of someone else’s suicide (or any combination of these). Refer to QRG 13 for more information.

<table>
<thead>
<tr>
<th>Category</th>
<th>Practical Help</th>
<th>Problem Behaviour</th>
<th>Self and Community</th>
<th>Suicide Related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabis Use</td>
<td>□ Accommodation</td>
<td>□ Alcohol &amp; Drug issues</td>
<td>□ Confidence/direction/Significance</td>
<td>□ Another person’s suicide risk</td>
</tr>
<tr>
<td></td>
<td>□ Legal Aid</td>
<td>□ Anger/abusive behaviour</td>
<td>□ Discrimination/Stigma</td>
<td>□ Bereavement after suicide</td>
</tr>
<tr>
<td></td>
<td>□ Material/Financial Aid</td>
<td>□ Finance</td>
<td>□ Future/Vocation/Personal Growth</td>
<td>□ Callers suicidality</td>
</tr>
<tr>
<td></td>
<td>□ Z- Other Practical Help</td>
<td>□ Gambling</td>
<td>□ Loneliness</td>
<td>□ No second issue</td>
</tr>
<tr>
<td>Abuse and Trauma</td>
<td>□ Bullying/Retaliation</td>
<td>□ Sexual Compulsion</td>
<td>□ Migrant/settlement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Child Abuse</td>
<td>□ Social Compulsion</td>
<td>□ Self Confidence/Esteem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Community Crisis/Disaster</td>
<td>□ Z - Other Problem Behaviours</td>
<td>□ Sexuality Issues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Crime (victim/witness)</td>
<td></td>
<td>□ Social Justice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Domestic/Family Violence</td>
<td></td>
<td>□ Social Justice/discrimination/stigma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Elder Abuse</td>
<td></td>
<td>□ Z - Other Self and Community</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Sexual Assault/abuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment &amp; Loss</td>
<td>□ Z - Other Adjustment &amp; Loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family and Relationships</td>
<td>□ Caring for Family Member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Family/Partner Challenges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Parenting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Pregnant/Family planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Relationship Challenges - Non Family</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Relationships breakdown &amp; divorce</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Residency/Contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Z - Other Family &amp; Relationship Challenges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health and Disability</td>
<td>□ Intellectual Disability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Mental Health (of caller)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Mental Health carer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Physical Disability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Physical Illness/Health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Z - Other Health or Disability Issue</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Cannabis Specific Data

### For Users

1. What specifically prompted your call today?
   - [ ] Fight with partner about cannabis use
   - [ ] Fight with parent about cannabis use
   - [ ] Fight with other about cannabis use
   - [ ] Problems with employer about cannabis use
   - [ ] Health problem e.g. Chest
         - Other, specify: ____________________________
   - [ ] Mental health problems e.g. depressed, paranoid
   - [ ] Financial problem
   - [ ] Problems with police/legal problems
   - [ ] Wants help to control/stop Cannabis use

2. Age of first Cannabis use: ____________________________ (years old)

3. Pattern of use:
   - [ ] Daily/yearly daily
   - [ ] Weekly or more often
   - [ ] Monthly but not weekly
   - [ ] Less often but at least annually

4. Length of time smoking at this level:
   - [ ] At least a month
   - [ ] 1-6 months
   - [ ] 6-12 months
   - [ ] 1-5 years
   - [ ] 5-10 years
   - [ ] More than 10 years

5. History of Cannabis treatment?
   - [ ] Yes
   - [ ] No

6. In the past 12 months did you want or try to cut down your use of cannabis but found that you couldn't?
   - [ ] Yes
   - [ ] No

7. What other concerns do you have about your current levels of cannabis use?
   - [ ] Mental health
   - [ ] Physical health e.g. cough
   - [ ] Loss of control over use
   - [ ] Problems with relationships
   - [ ] Problems with work/school/study
         - Other, specify: ____________________________
   - [ ] Financial problems
   - [ ] Legal problems
   - [ ] Problems with family
   - [ ] Other, specify: ____________________________

8. Have you ever thought you had a problem with alcohol or other drugs?
   - [ ] Yes
   - [ ] No

### For Others

1. What is your relationship to the cannabis user you are concerned about?
   - [ ] Parent
   - [ ] Partner
   - [ ] Child
   - [ ] Sibling
   - [ ] Other relative
         - Other, specify: ____________________________
   - [ ] Friend
   - [ ] Student
   - [ ] Work colleague
   - [ ] Patient
   - [ ] Other, specify: ____________________________

2. What is the nature of your concern?
   - [ ] Behaviour e.g. aggression
   - [ ] Mental health
   - [ ] Physical health e.g. cough
   - [ ] Loss of control over use
   - [ ] Problems with relationships
         - Other, specify: ____________________________
   - [ ] Legal problems
   - [ ] Financial problems
   - [ ] Problems with work/school/study
   - [ ] Problems with family
Mental Health

The categories below inform your response to the caller and guide your approach to referrals. Work with what professional help they have and consider what additional mental health/GP referrals may be required. It is not the role of a Counsellor to diagnose mental disorders.

<table>
<thead>
<tr>
<th>Mental Health Themes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the caller report experiencing any of the following in the last two weeks? (select any):</td>
<td></td>
</tr>
<tr>
<td>☐ Anxiety / panic attacks / phobias</td>
<td>☐ Hearing voices / experiencing hallucinations</td>
</tr>
<tr>
<td>☐ Depression</td>
<td>☐ Suicide thoughts</td>
</tr>
<tr>
<td>☐ Drinking / drug problems</td>
<td>☐ Self harm</td>
</tr>
<tr>
<td>☐ Eating problems</td>
<td>☐ Other mental health condition, specify:</td>
</tr>
<tr>
<td>☐ Mood swings</td>
<td></td>
</tr>
<tr>
<td>☐ Reaction to traumatic event</td>
<td>☐ Unclear / not disclosed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Caller’s Situation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What features of the caller’s situation appear to be related to or affected by their mental health concerns? (select any)</td>
<td></td>
</tr>
<tr>
<td>☐ Abuse / trauma</td>
<td>☐ Relationship / family</td>
</tr>
<tr>
<td>☐ Abnormalities / support</td>
<td>☐ Work</td>
</tr>
<tr>
<td>☐ Disability</td>
<td>☐ Other, specify:</td>
</tr>
<tr>
<td>☐ Illness - general health</td>
<td></td>
</tr>
<tr>
<td>☐ Loss</td>
<td>☐ Unclear / not disclosed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Counselling / Treatment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated they were / known to be receiving treatment / counselling for: (select any)</td>
<td></td>
</tr>
<tr>
<td>☐ Anxiety disorders</td>
<td>☐ Under care of:</td>
</tr>
<tr>
<td>☐ Bipolar disorder (manic depression)</td>
<td>☐ Unable to collect</td>
</tr>
<tr>
<td>☐ Depression</td>
<td>☐ GP</td>
</tr>
<tr>
<td>☐ Dementia</td>
<td>☐ No identified professional care</td>
</tr>
<tr>
<td>☐ Eating disorders</td>
<td>☐ Psychiatrist</td>
</tr>
<tr>
<td>☐ Schizophrenias</td>
<td>☐ Psychologist</td>
</tr>
<tr>
<td>☐ Substance / alcohol misuse</td>
<td>☐ Other</td>
</tr>
<tr>
<td>☐ Personality disorder (s)</td>
<td>☐ On medication</td>
</tr>
<tr>
<td>☐ Post traumatic stress disorder</td>
<td>☐ Unclear / not disclosed</td>
</tr>
<tr>
<td>☐ Other, specify:</td>
<td></td>
</tr>
</tbody>
</table>
Suicide

Complete any sections that apply to your caller. Please note that at least one option must be selected within each group of data (e.g. Presenting features).

<table>
<thead>
<tr>
<th>Caller's own suicide thoughts/acts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presenting features:</td>
</tr>
<tr>
<td>☐ Current suicide thoughts</td>
</tr>
<tr>
<td>☐ Current suicide plan</td>
</tr>
<tr>
<td>☐ Suicide in progress</td>
</tr>
<tr>
<td>☐ Prior suicidal behaviour</td>
</tr>
<tr>
<td>☐ Unclear / not disclosed</td>
</tr>
<tr>
<td>Impact of others' suicidal behaviour:</td>
</tr>
<tr>
<td>Has anybody significant to the caller:</td>
</tr>
<tr>
<td>☐ Attempted suicide</td>
</tr>
<tr>
<td>☐ Completed suicide</td>
</tr>
<tr>
<td>☐ Unclear / not disclosed</td>
</tr>
<tr>
<td>Current supports:</td>
</tr>
<tr>
<td>☐ Professional (e.g. doctor, psychologist)</td>
</tr>
<tr>
<td>☐ Informal (e.g. family, friends)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Another person's suicide risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data specific to the 3rd party is not required but you should enter a safety plan into the Suicide risk management description box.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bereavement following a suicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>When did the suicide occur:</td>
</tr>
<tr>
<td>☐ Past 3 months</td>
</tr>
<tr>
<td>☐ 4–12 months</td>
</tr>
<tr>
<td>☐ 1-2 years</td>
</tr>
<tr>
<td>☐ 3 plus years</td>
</tr>
<tr>
<td>☐ Unable to collect</td>
</tr>
<tr>
<td>☐ Has the caller received any professional help for this loss?</td>
</tr>
<tr>
<td>☐ If yes, how many months after the suicide did they seek help?</td>
</tr>
<tr>
<td>☐ If no, is this the first counselling contact?</td>
</tr>
<tr>
<td>☐ Does the caller have thoughts of suicide?</td>
</tr>
<tr>
<td>(If this option is selected, please ensure that you complete the Suicide risk management description below.)</td>
</tr>
<tr>
<td>☐ Did the caller receive satisfactory informal support for this loss?</td>
</tr>
<tr>
<td>☐ Unclear / not disclosed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suicide risk management description (complete for all suicide calls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>* List any immediate risk (s) to the caller's life or safety.</td>
</tr>
<tr>
<td>* What was your safety plan for that immediate risk? (1-2 sentences)</td>
</tr>
<tr>
<td>* Go to the Action/Outcomes page – tick any boxes that apply.</td>
</tr>
</tbody>
</table>
### Actions / Outcomes

**What did the Counsellor/Supervisor do? (select any)**

- [ ] Contained a crisis
- [ ] Helped clarify issues and options
- [ ] Explored coping strategies
- [ ] Provided emotional support
- [ ] Linked to informal support
- [ ] Linked to existing professional help
- [ ] Assessed suicide risk
- [ ] Searched Lifeline Service Finder
- [ ] Searched other service directory
- [ ] Used interpreter
- [ ] Used National Relay Service
- [ ] Addressed immediate safety
- [ ] Contacted the Supervisor
- [ ] Agreed on a safety plan
- [ ] Police consulted (no trace requested)
- [ ] Police consulted (trace requested)
- [ ] Call trace flagged
- [ ] Flag date: 
- [ ] Flag time: 
- [ ] Income Line Number: 
- [ ] Called ambulance
- [ ] Called fire brigade
- [ ] Called with Police information Service

**What was the outcome? (select any)**

**Issues and options identified:**

- [ ] Caller identified issues
- [ ] Caller identified options and choices
- [ ] No issues or options identified

**Contracts made:**

- [ ] To call back
- [ ] To keep safe

**Caller feelings:**

- [ ] Caller expressed feeling more positive

**Caller’s assessment of the service:**

- [ ] Unable to collect
- [ ] Openly praised / thanked
- [ ] Seemed pleased
- [ ] No indication
- [ ] Seemed disappointed
- [ ] Expressed dissatisfaction

**Referrals given**

- [ ] Lifeline Service Finder
  - Referral Category 1: 
  - Referral Category 2: 
  - Referral Category 3: 
- [ ] Lifeline Information Service 1300 13 11 14
- [ ] Other Lifeline Service
Caller Story

The caller story is a legal record of the call.

The record should include the following information about the call and caller:
- name (if freely offered) and presenting problems / story
- caller's statements about situation and background
- observed/ stated emotional/ mental state
- caller's stated feelings and tone of voice
- repeated words or phrases

The record should not include:
- what the Counsellor experienced or thought about the caller's issues / situation
**Supervision**

**Counsellor to complete**

<table>
<thead>
<tr>
<th>The counselling process (what you did and how you did it)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Listening and empathising</td>
</tr>
<tr>
<td>☐ Reflecting</td>
</tr>
<tr>
<td>☐ Reframing</td>
</tr>
<tr>
<td>☐ Open questioning</td>
</tr>
<tr>
<td>☐ Closed questioning</td>
</tr>
</tbody>
</table>

Most challenging aspects of this call were...

What were your feelings at the end of the call?

| ☐ Uplifted | ☐ Satisfied | ☐ Feel OK | ☐ Tired | ☐ Worried | ☐ Annoyed | ☐ Frustrated | ☐ Other, describe below: |

Would you like follow up support / supervision (tick for yes): ☐

After supervision has been provided:

Supervision comments read (tick for yes): ☐

Additional discussion required (tick for yes - Counsellor to contact Supervisor): ☐

**Supervisor to complete**

Supervisor name: 

Bulk supervised: ☐

Supervision comments:
APPENDIX B:

THE IMPACT EVALUATION SURVEY
Impact Evaluation Survey

Section 1: Demographics

1. Sex? Male □2 Female□1

2. How old are you? ________________ years

3. Are you of Aboriginal or Torres Strait Islander origin?

   □1 Yes, Aboriginal
   □2 Yes, Torres Strait Islander
   □3 Yes, Aboriginal & Torres Strait Islander
   □4 No
   □5 Not stated

4. What is your main source of income?

   □1 Full-time employment
   □2 Part-time employment
   □3 Temporary benefit (e.g. sickness, unemployment,)
   □4 Pension (e.g. aged, disability)
   □5 Student allowance
   □6 Dependant on others
   □7 Retirement fund
   □8 Crime (property/dealing/sex work/other)
   □9 Other (specify) ____________________________
   □0 Not stated/not known/inadequately described
5. What is the highest level of education that you have completed? (NCHSR)

- Primary school only  □ 1
- Up to and including year 10  □ 2
- Up to and including year 12  □ 3
- Diploma or trade certificate  □ 4
- Attended university  □ 5
- Completed undergraduate degree  □ 6
- Completed postgraduate degree  □ 7

6. Who do you live with at the moment? (BTOM)

- Alone  □ 1
- Spouse/partner  □ 2
- Alone with child(ren)  □ 3
- Spouse/partner and child(ren)  □ 4
- Parent(s)  □ 5
- Other relative(s)  □ 6
- Friend(s)  □ 7
- Other (specify) ____________________  □ 8
- Not stated/not known/inadequately described  □ 0

7. What is your current living situation? Do you...

- Own your own home  □ 1
- Renting  □ 2
- Living with friends/family  □ 3
- Other _______________  □ 4
Section 2: Helpline questions

The next set of questions relate to your experiences with the Cannabis Information and Helpline.

1) a) When you were invited to participate in this research study, was that your first call to the Cannabis Information Helpline?  
   Yes □  
   No □ 
   b) If No: Approximately how many times have you called before?  N/A □ 
   c) How long ago did you first call? ________________

2) Where did you first hear of the 1800 30 40 50 number?

   Phone book search □ 1
   Online search □ 2
   Saw advertising and decided to call □ 3
   It was suggested □ 4
   Other _____________________________ □ 5

3) a) Were you able to get through to a counsellor when you first called?  Yes □ No □
   b) Did you call during office hours?  Yes □ No □
   c) Did you leave a message?  Yes □ No □ N/A □
   d) If No; Why did you not leave a message?
      ___________________________________________________________________________________

4) How long did you have to wait until you were able to speak to a counsellor?
   ___________________________________________________________________________________
   □ no wait
5) Please rate from 0 to 10 how easy it was for you to get through to a counsellor on your last call occasion, where 0 is “Not at all easy”, ‘5’ is “Moderately easy” and ‘10’ is “Very easy”

________ / 10

6) a) Was your call to the Helpline your only option for seeking help?

Yes ☐
No ☐

b) What other options for help are you aware of? None ☐<------|

______________________________________________________________
______________________________________________________________
______________________________________________________________

c) Was the Helpline your preferred option for seeking help?

Yes ☐
No ☐
N/A ☐

d) If other options: Why did you chose to call the Helpline instead of accessing an alternative form of help? N/A ☐

______________________________________________________________
______________________________________________________________
______________________________________________________________

7a) Before calling, how did you think the service would be able to help you?

Counselling ☐1 Someone to talk to ☐6
Information (data) ☐2 Neutral, no real expectation ☐7
Information (no data) ☐3 Strategies to deal with a situation ☐8
Other non-counselling ☐4 Releasing pressure ☐9
Unclear ☐5 Referral ☐10
Other ☐11

______________________________________________________________
7b) If Counselling: what was the counselling for;

Cannabis use (own) □ 1  Cannabis use (other) □ 6
Abuse and Trauma □ 2  Problem Behaviour □ 7
Family Relationships □ 3  Health and Disability □ 8
Self and Community □ 4  Suicide Related □ 9
Adjustment and Loss □ 5  Other □ 10

Other
____________________________________________________________________
____________________________________________________________________

Section 3: Counsellor questions

1.0 Client Satisfaction Questionnaire (CSQ-8)

Please help us improve our program by answering some questions about the services you have received. We are interested in your honest opinions, whether they are positive or negative.

a. How would you rate the quality of the service you have received?

    Excellent    Good       Fair       Poor

b. Did you get the kind of service you wanted?

    No, definitely   No, not really   Yes, generally   Yes, definitely
c. To what extent did the Helpline meet your needs?

Almost all (needs)  Most           Only a few      None

d. If a friend were in need of similar help, would you recommend the Helpline to him or her?

No, definitely not  No, I don’t think so  Yes, I think so  Yes definitely

e. How satisfied are you with the amount of help you have received?

Quite dissatisfied Indifferent/mildly dissatisfied Most satisfied Very satisfied

f. Have the services you received helped you deal more effectively with your problems?

Yes, they helped Yes, they helped No, they really didn’t help No, made things worse
a great deal somewhat didn’t help things worse

 467
g. In an overall, general sense, how satisfied are you with the service you have received?

Very satisfied Mostly satisfied Indifferent or mildly dissatisfied Quite dissatisfied

h. If you were to seek help again, would you come back to our Helpline?

No, definitely not No, I don’t think so Yes, I think so Yes definitely
**2.0 Please describe your feelings about your most recent call to the Helpline. Would you say that you had a weak, moderate, strong or extremely strong feeling that...**

<table>
<thead>
<tr>
<th>Weak feeling</th>
<th>Moderate feeling</th>
<th>Strong feeling</th>
<th>Extremely Strong feeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- a. The things my counsellor said and did made me feel I couldn’t trust her/him.

  1 2 3 4

- b. My counsellor did not seem to be genuine.

  1 2 3 4

- c. My counsellor pretended to like or understand me more than she or he really does.

  1 2 3 4

- d. I felt that my counsellor thought that I am worthwhile.

  1 2 3 4

- e. My counsellor was friendly and warm toward me.

  1 2 3 4

- f. My counsellor did not really care what happens to me.

  1 2 3 4

- g. My counsellor understood what I said.

  1 2 3 4

- h. My counsellor understood my words, but not the way I felt.

  1 2 3 4

- i. My counsellor really sympathized with my difficulties.

  1 2 3 4

- j. My counsellor acted condescending; talked down to me.

  1 2 3 4
3) Please rate from 0 to 10 how much respect the counsellor showed to you during the call, where ‘0’ is “Did not show respect at all”, ‘5’ is “neither showed respect nor disrespect” and ‘10’ is “Showed complete respect”

_______/ 10

Section 4: Treatment questions

1) a) Did you make a plan of action with the counsellor?

   Yes ☐ No ☐

   b) If YES: Please rate from 0 to 10 how confident you are that you will be able to carry out this plan, where ‘0’ is “Not at all confident”, ‘5’ is “Somewhat confident” and ‘10’ is “Completely confident”

   _________ / 10 Already done ☐ N/A ☐

   c) If Yes: Please rate from 0 to 10 how much the counsellor directed you in making this plan, where ‘0’ is “Was not directed at all, the plan was all my idea”, ‘5’ is “I was showing an equal amount of direction as the counsellor” and ‘10’ is “The counsellor was completely directive”

   _________ / 10 Already done ☐ N/A ☐
2) a) In your opinion, In what way was the call helpful to you? Did the call help you to...

b) Please rate how helpful you found the call in this way from 0 to 10 where ‘0’ is “Not at all helpful”, ‘5’ is “Some help” and ‘10’ is “Very helpful”.

c) Please rate on a scale of 0 to 10 the extent to which the call impacted on you in this way ... where ‘0’ is “No impact” ‘5’ is “Some impact” and ‘10’ is “Large impact”

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

a) Reduce your cannabis use? □1  b) _____ / 10 N/A □ c) _____ 10 N/A □
a) Quit your cannabis use? □2  b) _____ / 10 N/A □ c) _____ 10 N/A □
a) Deal with family relationships? □3  b) _____ / 10 N/A □ c) _____ 10 N/A □
a) Gain employment/work/study? □4  b) _____ / 10 N/A □ c) _____ 10 N/A □
a) Manage financial problems? □5  b) _____ / 10 N/A □ c) _____ 10 N/A □
a) Manage legal problems? □6  b) _____ / 10 N/A □ c) _____ 10 N/A □
a) Provided support □7  b) _____ / 10 N/A □ c) _____ 10 N/A □
a) Other _____________________ □8  b) _____ / 10 N/A □ c) _____ 10 N/A □

3) a) Were you offered a referral? YES □ NO □

b) What was it? ________________________________

c) If linked to support or help: Did you make contact with the support/help that you were linked to?

YES □ NO □ N/A □

d) If NO: Please rate from 0 to 10 the likelihood that you will make contact with the support/help in the future, where ‘0’ is “No chance”, ‘5’ is “probably” and ‘10’ is “Definite”.

_______ / 10 N/A □
4) Did you feel that you had an unmet need after calling the service?
(NO □)
______________________________________________________________
______________________________________________________________
______________________________________________________________

5) Did you feel that the CIH service could improve on their current operations?
(NO □)
______________________________________________________________
______________________________________________________________
______________________________________________________________

6) a) Please indicate from 0 to 10 your overall general satisfaction with the call, where 0 is ‘Not at all satisfied’ 5 is ‘some satisfaction’ and 10 is ‘completely satisfied’.

_______ / 10

7) If you felt that you needed similar help in the future, what is the likelihood that you will call again as opposed to seeking help from another service? From 0 to 10 where ‘0’ is “Definitely will not call again” ‘5’ is “May call again” and ‘10’ is “Definitely will call again”.

_______ / 10
Section 5: Treatment handouts and self-help

1) a) Did you ask to receive some printed information from the Helpline service?

   Yes ☐   No ☐

b) If YES; Did these materials arrive in the time you had expected?

   - Received in good time ☐ 1
   - Received, but not in good time ☐ 2
   - Not received, but still within time ☐ 3
   - Not received and out of time ☐ 4
   - Has not yet placed the order online ☐ 5
   - Moved address / Can’t get ☐ 6
   - Already had them / didn’t want them ☐ 7
   - Read them / downloaded from internet ☐ 8

c) If YES: Did you read the printed information?

   Not at all ☐ Less than half ☐ More than half ☐ N/A ☐

d) If YES: Please rate, from 0 to 10 how helpful you found these materials, where ‘0’ is “Not helpful at all”, ‘5’ is “Neither helpful nor unhelpful” and ‘10’ is “Extremely Helpful”?

   ____ / 10 N/A ☐

2) a) During the call, did the counsellor refer you to the NCPIC website?

   Yes ☐   No ☐   No need/ No connection ☐

b) If YES; Did you access the website?

   Yes ☐   No ☐   Not yet, but intend to ☐ N/A ☐
3) a) Have you ever discussed concerns about your cannabis use with a health worker or other professional? (record yes/no below)

<table>
<thead>
<tr>
<th>Profession</th>
<th>Consulted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP/doctor</td>
<td></td>
</tr>
<tr>
<td>Community Health Centre</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td></td>
</tr>
<tr>
<td>Other Tele-C.</td>
<td></td>
</tr>
<tr>
<td>Social worker</td>
<td></td>
</tr>
<tr>
<td>Mental health service</td>
<td></td>
</tr>
<tr>
<td>Drug treatment service</td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>

Section 6: Cannabis use

1. Please indicate how often you usually use cannabis currently;

   - Never used ☐0 Less than once a year ☐1
   - Once a year ☐2 Two/three times in the year ☐3
   - Monthly ☐4 Fortnightly ☐5
   - Weekly ☐6 Daily ☐7
   - Abstinent ☐8
   - Other ____________________________[9] N/A ☐

2. a) How many days did you use cannabis in the last 90 days?

   ________ days N/A ☐

   b) How many cones / joints would you use in a day when you would usually use cannabis? N/A ☐

      ___________ cones ___________ joints
APPENDIX C:

THE CANNABIS ASSISTANCE HELPLINE

TREATMENT MANUAL
Cannabis Assistance HelpLine

TREATMENT
CONTENTS

1. The Cannabis Assistance Helpline (CAHL)....................................................... 1
1.1 Background........................................................................................................ 1
1.2 Current cannabis treatment options.................................................................. 2
1.3 The benefits of telephone counselling as a form of cannabis treatment......... 3
1.3.1 Telephone counselling is immediate, brief and easily accessible............... 3
1.3.2 Telephone counselling addresses the stigma associated with entering treatment................................................................. 4
1.3.3 Telephone counselling may effectively substitute for face-to-face counselling................................................................. 4
1.4 The CAHL treatment approach....................................................................... 4
1.4.1 The Check-up model................................................................................ 5
1.4.2 Cognitive Behavioural Treatment.......................................................... 5
1.4.3 Motivational interviewing strategies................................................... 6
2.0 Methodology.................................................................................................. 7
2.1 Aims and Objectives.................................................................................... 7
2.2 Participants................................................................................................... 7
2.2.1 Recruitment............................................................................................ 7
2.2.2 Eligibility criteria.................................................................................... 8
2.3 Procedure..................................................................................................... 8
3.0 Session One: Cannabis and the Participant.............................................. 11
3.1 Approximate length..................................................................................... 11
3.2 What you will need for Session One.......................................................... 11
3.3 Aims of Session One................................................................................... 11
3.4 Procedure..................................................................................................... 11
3.4.1 Establish rapport with the participant and introduce the Workbook.............. 12
3.4.2 Explore the problem situation and introduce the CAHL model................. 12
3.4.3 Review the PFR.......................................................................................... 14
3.4.4 Assess the need for information and provide the information................. 16
3.4.5 Identify a change date and organize follow up phone calls....................... 16
3.4.6 Doing it: Scheduling the cannabis reduction............................................. 17
3.4.7 Home work................................................................................................ 19
3.4.8 Wrap up...................................................................................................... 21
3.4.8.1 Post session........................................................................................... 21
4.0 Session Two: Preparing for Change................................................................. 23
4.1 Approximate length....................................................................................... 23
4.2 What you will need for Session Two............................................................. 23
4.3 Aims of session two...................................................................................... 23
4.4 Procedure...................................................................................................... 23
4.4.1 Reconnecting with the participant............................................................. 24
4.4.2 Participants who were successful in reducing their cannabis use.............. 25
4.4.2.1 Recognising personal triggers for smoking......................................... 26
4.4.2.2 Decisional Balance: Outweigh the benefits of smoking with the
              benefits of abstinence.............................................................................. 27
4.4.3 Participants who were not successful in reducing their cannabis use........ 29
4.4.3.1 Re-setting the participant’s change date.............................................. 30
4.4.3.2 Affirming that change is possible at this time..................................... 31
4.4.4 Self-help exercises.................................................................................... 31
4.4.5 Wrap up..................................................................................................... 32
4.4.5.1 Post session.......................................................................................... 33
6.4.4 Wrap up: End the treatment sessions.......................................................... 48
6.4.4.1 Post session.................................................................................................. 49
7.0 General issues.................................................................................................. 50
7.1 Consent.............................................................................................................. 50
7.2 Participants Contact Form................................................................................ 50
7.3 The Participant Feedback Report (PFR).......................................................... 50
7.4 Self-Monitoring Cannabis Use Diary.............................................................. 51
7.5 Clinical checklists........................................................................................... 51
7.6 Session Quick Guides...................................................................................... 52
7.7 Contact procedures and organising treatment sessions............................... 52
7.8 Unreachable participants and incomplete sessions........................................ 53
7.9 Participants wishing to withdraw from the CAHL program........................ 53
7.10 Mandatory reporting issues......................................................................... 54
7.10.1 How to deal with the disclosure of child abuse or other risk of harm...... 54
7.10.2 How to deal with the disclosure of plans to seriously hurt self or others..... 54

References............................................................................................................. 56

Appendix A: Participant Eligibility Script............................................................. 63
Appendix B: Participation Screener........................................................................ 65
Appendix C: Participant Contact Form................................................................... 66
Appendix D: Participant Feedback Report (PFR).................................................. 67
Appendix E: Cannabis Use Self-Monitoring Diary................................................. 76
Appendix F: Clinician Checklist............................................................................ 77
Appendix G: Session Quick Guides....................................................................... 81
1. THE CANNABIS ASSISTANCE HELPLINE (CAHL)

1.1 Background

The Cannabis Assistance Helpline (CAHL) project was funded by the Australian Government Department of Health and Aging as an activity of the National Cannabis Prevention and Information Centre (NCPIC). The CAHL program was developed in collaboration between NCPIC and the Cannabis Information and Helpline (CIH).

Longitudinal research has demonstrated that only a tenth to a third of cannabis dependent individuals enter treatment (Agosti & Levin, 2004; Stephens, Roffman, Fearer, Williams & Burke, 2007; Swift, Hall & Copeland, 2000). In light of this research, NCPIC recently conducted a study on the barriers and facilitators of cannabis treatment (Gates, Taplin, Copeland, Swift & Martin, 2009). This study highlighted the need for improving the availability of specialised cannabis treatments to the community, thus offering an alternative to current general drug treatment centres that were not found to be as attractive to cannabis users not using other drugs. To address this need, NCPIC created three alternative cannabis treatments for the community: 1) a web based cannabis intervention; 2) a mail based cannabis intervention; and 3) a telephone-based cannabis intervention. This manual is designed to assist telephone counsellors in providing evidence-based treatment to cannabis users seeking assistance to make changes to their cannabis use over the phone.

The usual functioning of the CIH does not include the provision of treatment but rather offers information, brief advice and referral to treatment seekers. The efficacy of including this CAHL model as a treatment option will be examined in a randomised control trial comparing the CAHL model to a delayed treatment control group.
The CAHL is consistent with NCPIC’s key goal of:

- providing the community and service providers with evidence-based interventions to respond to people experiencing cannabis-related problems

This manual provides a detailed description of the telephone-based brief intervention and how it should be implemented. The CAHL model draws on: the principles and techniques of motivational interviewing (MI) (Miller & Rollnick, 2002) and cognitive behavioural therapy (CBT) (Marlatt & George, 1984; Marlatt & Gordon, 1985; Monti et al., 2002). Two previous cannabis interventions were used as a foundation for the CAHL model; Martin et al.’s (2004) MI-based Adolescent Cannabis Check-Up, and Rees et al.’s (2000) CBT-based cannabis intervention (Rees, Swift & Copeland, 1998).

1.2 Current cannabis treatment options

In 2006 – 2007, there were close to 32,000 completed treatment episodes for people with a primary cannabis concern (AIHW, 2008). Increasing evidence demonstrates that this figure represents only a handful of all the individuals who may benefit from treatment for their cannabis-related problems (Agosti & Levin, 2004; Stephens et al, 2007; Swift, Hall & Copeland, 2000; Treloar & Holt, 2006). In addition, retention in treatment and relapse rates (edging on 50%) are problematic and long-term outcomes are largely unknown (Moore & Budney, 2003).

A recent study of over 300 Australian individuals who used cannabis, recruited from treatment settings and the community, investigated the barriers and facilitators to cannabis treatment (Gates et al., 2009). Participants believed that a typical cannabis user avoids treatment because it is either 1) unnecessary or 2) they want to avoid the stigma associated with being labelled a drug addict. Further, the participants believed that the public was not sufficiently aware of treatment options and thought that available
treatment was difficult to access. However, the participants felt that treatment could be better facilitated by increasing the availability of information on treatments while also making treatment more accessible and specific to cannabis. As is shown below, telephone counselling addresses these identified barriers and facilitators to cannabis treatment.

1.3 The benefits of telephone counselling as a form of cannabis treatment

1.3.1 Telephone counselling is immediate, brief and easily accessible

Many telephone counselling and referral services were established to provide support to an individual at any time of day or night (Coman, 1996; Coman, Burrows & Evans, 1997; Hunt, 1993). In the field of drug and alcohol, support is most important during strong urges or cravings especially at the time of a quit attempt (Zhu & Pierce, 1995). Thus, telephone counselling could provide support when it is most needed.

Further, access to traditional treatments can be discouraging for those not outwardly mobile or geographically distant from a service (Evans, Smith, Werkhoven, Fox & Pritzl, 1986; Swinson et al., 1995; Zhu et al., 1996). Additionally, an individual accessing traditional ongoing treatment is required to stay within physical reach of the service over the duration of treatment (Coman, 1996; 1997). These constraints do not apply to clients of a telephone-based treatment.

In a review of the important features of smoking cessation treatments, Baille et al. (1990) found that the most pertinent characteristics of an intervention are: effectiveness, cost, time, and ease of administration. In this review, packaged and brief interventions such as telephone counselling, showed the best balance of all these factors. This is because they are brief, effective and low cost.
1.3.2 Telephone counselling addresses the stigma associated with entering treatment

Clients of a telephone counselling service typically are not required to reveal their identity (Evans et al., 1984, 1986). This benefit can be important to members of a rural community when it is more likely that individuals may know each other. This is of even greater importance to individuals using cannabis, given that it is illegal to use or possess cannabis.

Additionally, clients may be more forthcoming given the physical separation and resulting reduced likelihood of intimidation (Evans et al., 1984).

1.3.3 Telephone counselling may effectively substitute for face-to-face counselling

Research has shown that telephone counselling can also incorporate the factors important to face-to-face counselling such as empathy and understanding, displaying unconditional positive regard, and genuineness (Coman, 1996, 1997; Rosenfield, 1997). In addition, telephone counselling has been shown to be an effective platform for employing techniques including cognitive and behavioural (Coman 1996, 1997; Rosenfield, 1997; Rosenfield & Smillie, 1998; Rosenfield & Urben, 1994; Swinson et al., 1995; Zhu et al., 1996) and motivational enhancement therapy (See Lichtenstein et al, 1996; Miller & Wood, 2007; Stead, 2007; and Young, 2003 for a review).

1.4 The CAHL treatment approach

The CAHL model is a four session program based on cognitive behavioural techniques (Marlatt & Gordon, 1985; Monti et al, 2002) with a strong emphasis on motivational interviewing (Miller & Rollnick, 2002). The model is a further development of the brief two session assessment and feedback cannabis intervention known as the Cannabis Check-Up (Martin, Swift and Copeland, 2004) and a six session CBT-based cannabis
intervention (Rees, Swift & Copeland, 1998). The different theories and models informing the CAHL model are briefly summarised below.

1.4.1 The Check-up Model

The Check-up model has taken different forms and has been adapted to suit a variety of populations (Walker, Roffman, Picciano & Stephens, 2007). Each adaptation shares four common elements: 1) the assessment of behavioural patterns and opinions regarding current use and the benefits of change, 2) the model emphasises feedback and support where the client is not ‘pushed’ but offered the choice to accept or reject feedback, 3) the utilisation of a Personalised Feedback Report (PFR) which includes information on a participant’s behaviour, pros and cons of that behaviour, goals and readiness to change; and 4) they rely heavily on motivational interviewing principles and the principals of harm reduction and the stages of change (the Transtheoretical Model [DiClemente, 2003]).

1.4.2 Cognitive Behavioural Treatment

The core of cognitive-behavioural treatment (CBT) for drug problems is the development of personal coping resources to help an individual deal with high-risk drug taking situations (Marlatt & Gordon, 1985; Monti et al, 2002). These coping skills are enhanced through the provision of interactive exercises and practice assignments to assist in avoiding cannabis use (Steinberg et al, 2005). CBT uses non-judgemental therapeutic techniques to address problematic ‘cognitions’ that may lead to drug use (Brickman et al, 1982). As CBT is guided by the premise that cognitions and behaviours are intrinsically linked, it is thought that by changing an individual’s thoughts; behaviour change will follow. Typically CBT sessions are structured and require a participant to do ‘homework’ tasks or self-help exercises that help them develop a set of
skills in the context of their drug use. Copeland et al. successfully applied CBT techniques to a face-to-face brief cannabis treatment (Copeland, Swift, Roffman & Stevens, 2001). The CAHL project draws from this work, adapting the techniques to be used over the telephone.

1.4.3 Motivational Interviewing Strategies

Motivational interviewing strategies (Miller & Rollnick, 2002) are based on processes that will help an individual prepare for and make changes. The most central of these processes are: open-ended questions, reflective listening, affirmation of the participant, periodic summaries of the participant’s thoughts and feelings regarding drug use, and the elicitation of self-motivational statements. At all times the counsellor should express empathy and encourage participants to explore discrepancies between their goals and current behaviour, while avoiding argumentation. Motivational interviewing techniques can be used to help participants explore their feelings about drug use and enhance their existing abilities and support systems in order to make change. Both one (Copeland et al., 2001) and two sessions (Stephens, Curtin & Roffman, 2000) of motivational interviewing have been shown to be more effective than no treatment for reducing cannabis-related problems.
2.0 METHODOLOGY

The CAHL model is a four session intervention designed to develop behaviours that lead to the reduction and cessation of cannabis use. That is, it is less a ‘feedback and support’ model for pre-contemplative individuals, and more a directive model where the participants are assisted to recognise the benefits of change and are trained in skills that work towards a reduction of use and prevention of relapse. In addition, the CAHL model includes a Personalised Feedback Report (PFR) to assist the counsellors in providing the participant with feedback regarding their cannabis use behaviours.

2.1 Aims and objectives

The specific objectives of the CAHL model are to:

- Provide education on the harms related to cannabis use
- Enhance motivation to reduce/cease cannabis use
- Increase skill sets for behavioural changes that lead to cannabis reduction/cessation
- Increase skill sets to help prevent relapse to cannabis use post treatment

2.2 Participants

2.2.1 Recruitment

Eligible participants are individuals who call the CIH voluntarily. The recruitment efforts will be undertaken solely by the counsellors taking calls to the CIH. The counsellors will inform callers of the study using the script provided on the consent form (Appendix A). Those callers that show an interest in participating will be asked to provide contact information to be recorded in the Participant Contact Form (Appendix
C). The participant will be informed that a NCPIC staff member will contact them to ensure eligibility and gather relevant information.

2.2.2 Eligibility criteria

The eligibility of each interested caller will be determined by a NCPIC researcher using the following criteria:

- Aged at least 16 years
- Used cannabis in the last 30 days
- Not currently in alcohol or drug treatment

In addition to assessing eligibility, this formal screener (see Appendix B) provides important information on the characteristics of callers who are ineligible for the study and those who are eligible but not interested or fail to attend their appointment. These people can then be compared to those who participated.

2.3 Procedure

During each call to the CIH the counsellor should be able to determine if the caller is seeking help for their cannabis use by addressing the reason for calling. Each caller who appears interested in receiving help to reduce their cannabis use should be read the consent form at the end of the call. The Participant Contact Form should be completed so as to forward contact information of potential participants to a NCPIC researcher in order to determine eligibility.

Eligible participants then will be asked by the researcher to provide baseline pre-treatment information. Following this interview, the researcher will randomly allocate the participant to either immediate treatment or delayed treatment. The Participant Contact Form and Personalised Feedback Report will be forwarded to the counsellors...
trained in the CAHL model. In addition, the researcher will mail any interested participants the *Quitting Cannabis Workbook* and *Cannabis Use Self Monitoring Diary* (materials also available from the NCPIC website).

*The first session* of the CAHL model review utilises non-judgemental supportive listening while incorporating motivational interviewing techniques (such as expressing empathy, developing discrepancy or highlighting slip ups, avoiding argumentation, rolling with resistance and supporting self-efficacy). The initial session is designed to achieve five goals, including: 1) actively exploring the problem situation (by personalising the health effects of smoking); 2) advising the participant about their level of cannabis use and dependence; 3) providing relevant information and advice as necessary; 4) setting a change date and scheduling cannabis reduction; and 5) organizing the follow-up phone calls. In addition, the participant will be introduced to the CAHL model and assisted to use the *Quitting Cannabis Workbook*.

*The second session* of the CAHL model should be conducted seven days from the first session. This involves assisting participants in identifying their thoughts, feelings, and behaviours that lead to cannabis smoking. In addition, this session will focus on identifying the context within which the individual’s cannabis use typically occurs. This session is designed to achieve five goals, including: 1) reconnecting with the participant, 2) identifying high-risk situations and triggers to using cannabis, 3) weighing up the pros and cons of smoking and abstinence such that the balance tips towards the pros of abstinence, 4) ensuring the participant is motivated and capable of making change to their cannabis use, and 5) giving the participant self-help exercises to complete between sessions.
The third session of the CAHL model should be conducted seven days from the second session. This intervention component is designed to help increase the participant’s set of strategies that can be used to avoid smoking. This session is designed to achieve four goals, including: 1) reconnecting with the participant, 2) ensuring the participant has emergency plans and strategies to draw from when offered cannabis, 3) identifying the participant’s cognitions that lead towards smoking and expectancies surrounding cannabis use, and 4) giving the participant self-help exercises to complete between sessions.

The final session of the CAHL model should be conducted seven days from the third session. This intervention component is designed to reinforce all the previous sessions by establishing weak points in the participant’s skills and bolstering them. In addition, this session is designed to leave the participant with sufficient skills to continue their cannabis reduction in the absence of treatment. The final session has five goals: 1) identify the need to re-educate the participant on coping strategies, 2) informing the participant on what to expect in the event of relapse and educating the participant regarding relapse prevention techniques (rationalising, preparing for loss, self monitoring and self rewards), 3) ensure the participant has adequate social support in the absence of the CAHL program, 4) ensure the participant has confidence in continuing cannabis reduction in the absence of the CAHL program, and 5) closing the treatment.
3.0 SESSION ONE: CANNABIS AND THE PARTICIPANT

3.1 Approximate Length: 60 minutes

3.2 What you will need for Session One

1. The Participant Feedback Report (PFR)
2. The ‘Quitting Cannabis Workbook’
3. The ‘Cannabis Use Self-Monitoring Diary’
4. The Session One Quick Guide
5. The Session One Clinician Check-list
6. The Participant Contact Form

3.3 Aims of Session One

This session aims to:

1) Establish rapport with the participant and explore the problem situation
2) Educate the participant on aspects of cannabis use and introduce the CAHL model
3) Introduce the Workbook
5) Set a ‘change date’ and schedule cannabis reduction
6) Give the participant self-help exercises and organise treatment sessions

3.4 Procedure

Before making the call, review the supplied PFR. You will need to review the provided information on the quantity and frequency of their cannabis use, how much they spend on cannabis in the week, their level of dependency (based on SDS score) and their stage of change.
3.4.1 Establish rapport with the participant and introduce the Workbook (10 minutes)

To begin, welcome the caller and take some time to establish rapport. Introduce
yourself and inform the caller about the reason for your call. Before proceeding too far
with the conversation, remind the participant that they have given their consent to
participate in the CAHL program and briefly review the consent form step-by-step (see
the Quick Guide). Inform the participant that they will receive a copy of the consent
form to keep. Answer any questions they may have.

Next, introduce the participant to their copy of the ‘Quitting Cannabis Workbook’. The
participant will have been informed by the researcher that the Workbook is designed to
complement the telephone service and that the participant will be asked to work through
the booklet during, and after, each call. Check that the participant has their Workbook
close by and inform them they will be asked to work with it during each call.

Participants who have not yet received the Workbook should be encouraged to keep
paper records. Next, engage the participant in a conversation about how they are feeling
by using open-ended questions.

3.4.2 Explore the problem situation and introduce the CAHL model (10 minutes)

In this part of the call you will be dealing with the participant’s motivation to change
their level of cannabis use. To begin exploring, ask the participant to volunteer the main
problem or concern they are experiencing with their cannabis use. Although it is likely
that the participant will mention many concerns, try to select what seems to be the
major concern for the participant and spend some time relating how this problem
impacts on a personal level. That is, assist the participant to explore the personal
meaning and implication of the problem. For example, if the participant mentions that
they smoke to help cope with a nagging or critical boss, you can help the participant
explore what pains the participant’s boss is causing them and how using cannabis helps them cope. As the participant mentions their problems, it will be a good opportunity to express your empathy regarding their situation. Also, be sure to make a note of the participant’s perceived problems with cannabis use in the PFR for later reference.

Some participants may not have any real concerns regarding their cannabis use and other participants may have problematic assumptions regarding their use. Here, you should take the opportunity to educate all the participants on some of the more harmful effects of using cannabis. A quick summary of the short and long term health effects of cannabis use may be helpful. The most pertinent short term health effect is an increase to the risk of heart attack due to an elevation in heart rate of 20 – 50 per cent. Some long term health effects include: the increased risk of cardiovascular disease, cancer, respiratory illness, and impaired immune and reproductive systems. See the Quick Guide for some further examples of typical problems caused by cannabis use.

Once you have an understanding of the problems that cannabis use is causing the participant, explain the basic principles of the CAHL model and how it will be able to address these issues. More specifically, explain that the treatment sessions are based on cognitive behavioural therapy techniques. That is, the sessions each follow the basic principle that our cognitions influence our emotions and behaviour and vice versa. Spend some time explaining that the participant’s cannabis use is a result of certain cognitions and that you will be attempting to highlight these thoughts that are related to cannabis use. In essence the sessions are a collection of techniques and strategies that the participant will be taught to help avoid using cannabis in any situation. Inform the participant that by working with their thoughts associated with cannabis use they will begin to change their patterns of cannabis use, help them cope with the idea of reducing
their use, build their coping skills and reduce any negativity they may feel when reducing.

3.4.3 Review the PFR (20 minutes)

Once you have established rapport and have an understanding of the participant’s problems with their cannabis use, the next step will be to give the participant some feedback regarding their PFR. You will be provided with the participant’s PFR before making the call. The PFR includes information regarding the participant’s patterns of cannabis use and dependence, costs of use, reasons for using cannabis, stage of change and past attempts at reducing use. In addition, you will use the PFR to record various aspects of the participant’s participation in these treatment sessions. In this way, it acts as a case management tool. The participant will be aware you have received their personal information. Hence, you can begin by informing them that you have looked over their assessment results and would like to explore their responses, starting with their level of cannabis dependence.

To address the participant’s dependence on cannabis, you should briefly discuss the criteria of cannabis dependence according to the Severity of Dependence Scale (SDS) (shown on the PFR). Explain that the participant’s symptoms (the individual items of the SDS) are directly linked to their level of dependence (the SDS score). For those participants who have received the Workbook, indicate that they can keep a record of their SDS score in their Workbook Section 1 (‘cannabis and you’, page 4). Use the PFR to inform the client of their level or severity of dependence (mild to severe). Use motivational interviewing techniques to assess the participant’s perception of their SDS score. Next, illustrate to the participant the percentage of similarly aged people with
cannabis dependence among the general population and among cannabis users (also shown on the PFR). Focus on how the comparison makes the participant think and feel.

Next, address the weekly cost of maintaining the participant’s recent level of cannabis use (shown on the PFR) where this is relevant. Highlight the money that the participant could save by not using cannabis and what this means to them personally. Some participants may say that cannabis is actually a cheap way of getting ‘high’ in comparison to other illicit drugs. In this case it will be helpful to assist the participant to identify the real costs in other aspects of their lives as well as other cheaper and enjoyable activities such as renting a movie.

Once the participant has a good knowledge of the severity of their cannabis dependence, inform the participant on what to expect in regards to the withdrawal symptoms commonly experienced when reducing cannabis use. Explain that these withdrawal symptoms are likely to be both psychological (irritability, trouble concentrating, anxiety, confusion, depression, anger, urges to smoke) and physical (sleeping problems, sweating more, loss of appetite, shaking). Be sure that you inform the participant that not everyone suffers the same severity of withdrawal symptoms and that some people do not experience any. Further, reassure the participant that the withdrawal symptoms are similar to those for tobacco. Importantly, explain that although the symptoms will sometimes be quite apparent, they are not dangerous and are actually signs of recovery. That is, the symptoms are our body’s way of saying that it is readjusting to no longer ‘expect’ cannabis. Illustrate that the symptoms will gradually fade over one or two weeks. Inform the participant that urges to use often will be triggered by certain situations (the triggers for use will be discussed in Session 3). Further, reassure the participant that urges pass and do not need to be acted upon. Encourage the participant
to think of a time when an urge that they had in the past did not last. To assist a participant who can’t identify such a time, ask them to think of an occasion when they were unable to source cannabis. If this doesn’t help, inform the participant that it has been identified in research that most people report urges to last no longer than approximately one hour (Heishman, Singleton & Liguori, 2001). In addition, if the participant is keen for more information, encourage them to refer to Section 1 (‘cannabis and you’: pages 1 – 4) and Section 4 (‘managing withdrawal’: pages 21 – 24) of the Workbook.

3.4.4 Assess the need for further information and provide the information (5 minutes)

In the conversations over the course of this first session, you may have become aware of any false or problematic beliefs the participant has about their cannabis use. Whenever necessary, provide the participants with evidence based information regarding their beliefs or assumptions. The NCPIC website can be used to help with this. Without spending too much time debating cannabis myths, try to ensure that the participant doesn’t leave the session with too many unanswered questions.

If you are asked a question that you are not sure how to answer, make a note of this in the PFR. In the post session wrap-up, take some time to address the question. If you are still unsure of the answer, feel free to email Peter Gates at NCPIC who will provide you with a response which you can convey to the participant in the next session.

3.4.5 Identify a change date and organise follow up phone calls (10 minutes)

The ultimate goal of this first session is to establish a ‘change date’, or a date in which the participant will commit to reduce their cannabis use. Generally, the participant will draw from their own past experience when deciding whether their goal will focus on
complete or partial reduction of their cannabis use. Emphasise that stopping cannabis may seem difficult in the beginning; however it will only get easier. Remind the participant that they will be supported in their attempt to abstain with three further weekly follow up calls. For those participants who are unwilling to aim toward abstinence, try to encourage them to at least adhere to some firm rules to restrict their use. Work with the participant to establish a set of rules such as not using on certain days of the week, reducing by a fixed percentage, delaying first smoke of the day, never actively sourcing a supply of cannabis etc.

Encourage the participant to make the change date during the time frame of the treatment sessions (within four weeks). Point out that making a particular date is important for ensuring that the participant makes a start on their plans to reduce their cannabis use. Making the change date within the scope of the treatment sessions will allow you to tailor the later sessions depending on whether the participant was successful or not in reducing their cannabis use. Explain that the following treatment sessions will focus on identifying strategies to help the participant achieve a reduction in their use and increase their coping skills. Encourage the participant to record their change date in the Workbook in on Section 5 (page 25) entitled ‘Putting It All Together’. You should also record their change date in the PFR.

3.4.6 Doing it: Scheduling the cannabis reduction (5 minutes)

The last aim of this session is to help the participant actualise a reduction in their cannabis use on their change date. In order to achieve abstinence, participants should be advised to begin by only smoking at specific times of the day and progressively lengthen the times between using cannabis. It should be recognised that some participants may wish to stop immediately. For those who wish to follow a reduction
regime, these times can be determined by following a ‘scheduled reduction’. That is, to begin the participant should smoke only two thirds as many joints/cones as usual and ration them throughout a sixteen hour day. That is, if the participant smoked 12 cones/joints per day they should be instructed to attempt only smoking 8 cones/joints \((2/3 \times 12 = 8)\) in the day, thus smoking once every two hours \((8/16 = 1/2)\). Following a successful reduction in use for one week, this can then be further reduced the following week. The participant would then continue to smoke one third the original number of cones/joints over the same sixteen hour day, thus have only one per four hours \((1/3 \times 12 = 4; 4/16 = 1/4)\). The participant will have a better chance at maintaining abstinence/reduction by following this scheduled reduction rather than going ‘cold turkey’ or taking a more haphazard approach (Cinciripini, Wetter & McClure, 1997). Importantly the participant should be informed of the need to plan for the quit attempt and should be encouraged to take this attempt very seriously. Encourage the participant to visualise themselves making a cannabis reduction in this way. Try to identify any possible problems that the participant may encounter and problem solve these with them. Inform the participant that keeping a diary can help with the reduction and that you will go in to more detail about this at the end of the session.

Some participants may need to spend additional time preparing to make a reduction in their cannabis use due to other circumstances. Some participants may be suffering from mental health issues, others may not have adequate housing, others may have too many other tasks to complete in their life, etc. These participants should first attempt to manage their extenuating circumstances. Sometimes participants can be assisted by asking friends or family to take on some of their normal responsibilities for a short while. Alternatively, you may need to refer the participant to an additional form of help before they attempt reducing their cannabis use.
Remind the participant that their goal may seem difficult now, but is certainly not impossible. Reassure the participant that the greatest problem they are likely to face when achieving their goal is the belief that it is going to be too hard. Ensure that the participant has confidence in their own ability by addressing any questions or comments that they might have. Importantly, the participant will need to believe they can actualise their change date.

3.4.7 Home work (10 minutes)

Towards the end of each intervention session you should attempt to bolster the participant’s self efficacy by encouraging them to spend at least ten minutes per day thinking about situations that provide the most temptation to use or result in difficulty controlling use. Secondly, strongly encourage participants to spend an equal amount of time thinking about the pros and cons of using cannabis and the pros and cons of reducing cannabis use. Encourage the participant to rate the importance (from 0 – 10) of every pro or con and advise them that these activities can be facilitated by completing Section Two (pages 5 – 10) of the Workbook on ‘preparing for change’. Participants without the Workbook can do the same thing on a blank sheet of paper.

The participant should be encouraged to use Section Four of the Workbook to help keep track of their own withdrawal symptoms when reducing their cannabis use. Section Four has an empty seven day diary for the recording of any occurrence and severity of withdrawal symptoms. Keeping a record of withdrawals will assist the participant in recognising that the symptoms they experience will reduce in severity and frequency quite quickly. The participant may notice that in the Workbook there is a brief mention of some strategies used to help assist in the management of withdrawals (distracting,
delaying, decatastrophising and de-stressing). Here, it may be helpful to mention to the participant that you plan on discussing these strategies at length in the sessions to come.

In addition to this, the participant should be encouraged to begin keeping a diary of their cannabis use. Along with the Workbook the participant should have received an example diary sent to them by mail, titled the ‘Cannabis Use Self-Monitoring Diary’. This diary replicates the one in the Workbook from Section 5 (‘putting it all together’, page 29). Inform the participant that by keeping a diary they will be assisted in identifying many of the thoughts and behaviours that lead them to use cannabis. This insight will make their goals of reducing cannabis use easier to accomplish. In the diary the participant should record any cannabis use, the situation in which they used (where and with whom), how strong their urges or desire to use were (from 0 – 10), what they were thinking and feeling at the time, and how successful they felt they were in managing their use (by giving it a ‘mastery rating’ from 0 – 10). Again, participants who have not received the diary should attempt the same thing using a blank sheet of paper.

For participants who seem ambivalent toward doing the self-help exercises it will be important to re-establish the reasons they wanted to participate in this treatment session and again encourage them that being abstinent will never be as hard as it seems in the beginning. Other participants may simply feel the self-help exercises assignments are not necessary. Try to explain the importance of self-help exercises as a bridge between treatment sessions and as a tool for improving the flow of following sessions. The topics covered in the self-help exercises will each be explored in the subsequent treatment session, so it will help if the participant has some familiarity with the concepts that will be discussed.
Before ending the call, ensure that the participant’s telephone details are current (including those of trusted friends) as shown on the Contact Form. Reassure the participant that any information they provide will be kept confidential. Thank them for their time and let them know you look forward to making the call for the second session.

3.4.8 Wrap up (2 minutes)

Towards the end of the call it is important to ensure that the main aims of the first session have been achieved. That is: 1) the participant has discussed their problems with cannabis use and reason for participating; 2) the participant received a short education on cannabis use and dependence; 3) their questions or concerns about the future are answered and 4) a change date has been set along with an action plan to assist the reduction attempt.

You will then need to negotiate a time and date to make the call for the next three sessions, with each session seven days apart. Although these dates can be slightly flexible, it is important to avoid deviating from the seven day gap between sessions as much as possible. Once you have agreed on the time and date for the weekly sessions fill out the PFR indicating the time and date of this first session and the proposed time and date for the subsequent sessions.

3.4.8.1 Post session

The post session wrap up is designed to bring closure to the treatment session and assist with organising subsequent sessions. During this first session you may have been asked a question regarding cannabis use that you were unsure how to answer. There should be a record of any of these questions in the PFR and your later response. Once you have
completed each call it will be helpful to review your own performance in the call by using the Clinician Check-List. Each of the required tasks in the treatment session will be shown and you will have the opportunity to record your performance as a rating from 1 to 5. If a supervisor was present during the call they also should complete the Check-List. In addition, take some time to write any appropriate notes in the PFR that may assist in bridging this session with the next.

Finally, make note of the time for the next session in your own work diary and file the PFR.
4.0  SESSION TWO: PREPARING FOR CHANGE

4.1  Approximate Length: 60 minutes

4.2  What you will need for Session Two

1. The Participant Feedback Report (PFR)
2. The ‘Quitting Cannabis Workbook’
3. The Session Two Quick Guide
4. The Session Two Clinician Check-list
5. The Participant Contact Form

4.3  Aims of Session Two

This session aims to:

1) Reconnect with the participant
2) Educate the participant on the triggers to using cannabis
3) Conduct the ‘decisional balance’
4) Ensure that each participant is motivated and capable of making change to their cannabis use
5) Give the participant self-help exercises and organise treatment sessions

4.4  Procedure

This session should be conducted approximately seven days from the date of the first session.

Before making the call, ensure that you are familiar with the PFR. Review the notes made from the first session to assist you in bridging the two sessions and re-familiarising yourself with the participant’s details. You should see whether the
participant had any unanswered questions regarding their cannabis use which can be addressed in this session. Finally, to assist the participant in learning new strategies for reducing cannabis use (in the self-help exercises of this session), it may be helpful to consider the participant’s previous attempts at quitting in terms of what they attempted and what went wrong.

4.4.1 Reconnecting with the participant (10 minutes)

Once you make the call, introduce yourself and explain the reason for your call. Ask the participant to reflect on how they felt between sessions generally and in regard to their cannabis use. If the participant’s change date has passed (which can be seen in the PFR), ask the participant if they managed to reduce their cannabis use. These sessions will follow a different format depending on whether the individual has been successful in reducing their cannabis use. Next, ask the participant what they remember was discussed in the previous session. Asking the participant to recall the first session will help them solidify the teachings from the first session and provide counsellors with an opportunity to provide further education about gaps in their knowledge regarding cannabis use. In addition, gauge whether the participant was able to complete their self-help exercises (shown in the Quick Guide). Congratulate participants who attempted to complete the exercises and inform them that they have taken an important first step in their reduction attempt and the session will now run more smoothly thanks to their effort. For participants who did not attempt the self-help exercises, spend a little time exploring the barriers that they faced and why they did not attempt it. The participant is not required to complete the self-help exercises; however it will increase the length of the session if they do not.
Finally, you should move into an explanation of this session. Here, you should mention that you will be discussing the participant’s thoughts, feelings and behaviours and how these are related to their cannabis smoking. Inform the participant that you will be focussing on the participant’s motivations to using cannabis and for reducing cannabis use.

Encourage the participant to have the Workbook handy and open to Section Two on ‘preparing for change’. The main aims for this session are outlined in the Workbook and it will improve the flow of the call for the participant to be prepared in this way.

4.4.2 Participants who were successful in reducing their cannabis use

This component of Session Two applies to participants who were able to reduce their cannabis use.

Be sure to congratulate the participant on their achievement. Spend a little time talking about the positive feelings associated with a reduction in their use. Where the participant doesn’t identify any positive feelings, assist them with a few examples (see Quick Guide). Perhaps the participant has noticed an improvement in their self-esteem or feelings of self efficacy in mastering a difficult challenge. Some participants may be inclined to refer back to their Severity of Dependence Score (SDS) using the Workbook. The SDS was not designed to be used in this way and may show some lag between change in the participant’s life and change in the score. Instead, encourage the participant to focus on actual real life changes they have made. In order to assist the participant in continuing with their reduction attempt it will be helpful to assist them in anticipating and planning for thoughts and situations that make abstaining from cannabis difficult.
4.4.2.1 Recognising personal triggers for smoking (20 minutes)

An important skill for reducing cannabis use is being able to recognise what specifically leads an individual to use cannabis. This knowledge will allow the participant to consciously avoid these ‘cues’ for smoking or be prepared to do something other than use in those contexts. To help this part of the session flow more easily, instruct the participant to open the Workbook to page 6 in Section Two and have their Cannabis Use Self-Monitoring Diary at hand. Begin by acknowledging that the participant may have underlying reasons for using cannabis, such as past traumatic experiences. However, you will be focussing on what specifically triggers their cannabis use at the time of use. Inform the participant that triggers or cues to use cannabis are usually a mix of internal (e.g. smoking to help cope with stress or boredom) or external (e.g. being influenced to smoke by a friend) events.

The next step will be to help the participant compile a list of their own triggers, both internal and external. Participants may already have a list of internal and external triggers outlined in their Workbook which can be discussed. Participants who used the Cannabis Use Self-Monitoring Diary to record their cannabis use also will have a reference to the situations that led them to use cannabis over the past week. However, if the participant is struggling to think of a personal high-risk situation, select some of the suggestions given in the Quick Guide. As the participant mentions a high-risk situation, record this in their PFR. Inform the participant that you will be developing strategies to help avoid high risk situations in the next session once the participant has had a chance to think of their own strategies as part of their self-help exercises from this session.

For now, however, inform the participant that urges to use cannabis will occur when they are confronted with internal and/or external triggers (such as times of stress or
when a friend who also smokes comes to stay). Urges are experienced physically due to a change in our brain chemistry and are a sign that the body is expecting cannabis. Importantly, this change will not continue to occur as cravings pass and do not need to be acted upon.

4.4.2.2 Decisional Balance: Outweigh the benefits of smoking with the benefits of abstinence (10 minutes)

Following identification of high risk situations, you should then attend to the pros and cons of smoking cannabis in order to assist the participant with a ‘decisional balance’. To help this part of the session flow more easily, instruct the participant to open the Workbook to page 9 in Section Two.

To begin this part of the session, it is important to acknowledge that there are positive aspects to smoking and that these may seem to outweigh the negatives. Use open ended questions to ask why the participant uses cannabis and how this benefits them. Throughout this conversation use reflective listening and offer an abbreviated summary. The intention is to compile a list of advantages for smoking. However, to increase the participant’s motivation to change it is important that the benefits of reducing cannabis use outweigh the costs of continuing to use cannabis. Again using open ended questions, ask the participant about the ways in which cannabis is not good for them. Again, follow with reflective listening and summarise. Participants who received the Workbook already may have recorded the good things and the not-so-good things about cannabis. In this case you will need to address and discuss each one with the participant. Once the participant has devised a particular benefit for smoking or not smoking, encourage them to rate the importance (from 1 – 10) of each. Once the list is complete you will be left with a total figure that objectively demonstrates the importance for both
the good and not-so-good things. Importantly, as the participant mentions any pros and cons of smoking take note of them in the PFR. The participant is not required to think of all the pros and cons to smoking cannabis immediately. Instead, offer a summary when the participant begins to lose momentum and encourage them give it more thought after the session.

The decisional balance technique aims to highlight to the participant that the cons of using cannabis outweigh the pros (thus tipping the ‘balance’ toward making a ‘decision’ to reduce cannabis use). To do so, the participant should be provided with a number of motivators to quit that hold more weight or personal meaning than reasons to continue smoking. To help with this, some motivators to reduce use are given in the session Quick Guide. Another way to motivate the participant is to work with them to increase the weight or personal meaning of the pros of abstinence and decrease the weight or personal meaning of the cons. Ask the participant “do you want to look again at the importance numbers?” For example, if the participant indicates that they enjoy smoking because they find it relaxing; devise alternatives that the participant may also find to be relaxing. Participants that continue to struggle to make an adequate list of the benefits of abstinence should be encouraged to ask other people in their life (such as family, friends, people who have quit before, etc.) for additional help once you end this session. Ensure that the participant understands the importance of completing these lists as a tool to give them the best possible chance at achieving their goal come the quit date. Once you have covered this section with the participant, attend to the self-help exercises as detailed in section 4.4.4 below.
This portion of Session Two applies to participants who mentioned that they were not successful in reducing their cannabis use post change date.

Initially this session will need to focus on what didn’t work for the participant and the reasons why change was not possible at this time. This is a good opportunity to use reflective listening and to show empathy with their struggle to achieve their goal. Importantly, you will need to help the participant explore in some detail what went wrong for them using open ended questions. Also ask participants about the feelings they had and the situation that they were in when they used cannabis. In particular, ask the participant what happened before and on their change date that hindered their reduction attempt. This process should be straightforward for participants who have been keeping a diary of their cannabis use. If you discover that the participant is not doing so, it would be a good opportunity to remind them of the importance of this tool.

Once you have heard the participant’s story, provide the participant with a brief summary. Reassure them that the first step is the hardest, but a reduction in cannabis use is entirely achievable when they have the right coping skills.

In order to help the participant try again to reduce their cannabis use it is important to ensure they are adequately motivated to do so. Begin by explaining how motivations can change quickly and often. This concept is also reflected in the ‘stages of change’ model which explains how participants move through different stages of the cycle of change. Importantly, advise the participant that they should not feel like they have failed because they were unable to stop using cannabis on this occasion and that it does not mean they will be unable to stop next time. Also, motivations are often competing, and depend on ‘drive’. That is, motivations compete when they have conflicting goals (for
example, the motivations of sleeping in or going to work) and depend on enthusiasm or drive (you may be more enthusiastic to sleep in). Reassure the participant that you understand they may have different motivations which will often compete and fluctuate in importance. Inform the participant that you will spend some time discussing to identify the situations where they use cannabis and their motivations at those times. To do so you should proceed to the ‘personal triggers for smoking’ and ‘decisional balance’ above (see section 4.4.2.1 and 4.4.2.2 of this manual).

4.4.3.1 Affirming that change is possible at this time (5 minutes)

Some participants may still feel that change is not possible at this time. These participants may find it helpful to spend a little time looking at problematic thinking patterns, including concrete thoughts such as ‘I can’t change’. To begin, give an example of two individuals who share a particularly critical boss. At the end of a particularly hard day, one man goes home and smokes cannabis to help alleviate his stress while the other man goes home and calls his friend for a chat and takes a long bath. Encourage the participant to think about the difference between these two men. Highlight that the man’s cannabis use is actually not a direct result of the nagging, but instead a result of 1) his belief that he needs cannabis to relax, and 2) the expectation that cannabis alleviates stress. Explain how positive expectancy can mediate low mood by elaborating as to how the man who smoked cannabis likely had his stress alleviated even before he began smoking while going through the preparations to smoke. Encourage participants to begin spending some time consciously separating their cannabis use from their belief that cannabis is the only thing that will relieve stress and explore what causes them to hold this belief. By separating their cannabis use from external events, the participant may be aided to challenge the link between them and
eventually learn to break it. In the example given, the individual will learn that their nagging boss causes stress and that they believe cannabis use alleviates stress; however these are two separate things. As shown by the second man, the cannabis use can be removed from the equation as the individual uses other ways to alleviate stress.

4.4.3.2 Re-setting the participant’s change date (15 minutes)

As the participant was unsuccessful in reducing their cannabis use on their change date, you will need to assist them in re-setting a new date. This can be done by following the procedure from Session One (see section 3.4.5 and 3.4.6 of this manual).

4.4.4 Self-help exercises (15 minutes)

During this session the participant may have gained some insight into the advantages of not smoking cannabis. However, it will not be enough to just gain an insight, they must also attempt behaviour change. The key will be for the participant to take an alternative to smoking cannabis or an advantage of not smoking cannabis and put it into action. To help the participant do this after this session, ask him/her to select an important benefit of not smoking (with the highest importance score) that would have a positive effect on their life. Next, ask them to break the benefit down into actionable pieces. For example, if the participant’s most important reason to stop smoking is to maintain a healthy lifestyle, they could break this down further by describing how an individual who currently has a healthy lifestyle differs to the participant’s current lifestyle. That is, an individual with a healthy lifestyle may: go to the gym more; breathe more easily; ride their bicycle to work; play more sport; and feel more confident and healthy. Once the participant has broken down a particular benefit into different parts, encourage them to action one of these.
Before spending time teaching the participant new strategies to avoid using cannabis in the next session, it is important that they discard any ineffective strategies they may have used in the past. The PFR will give some detail on previous attempts at quitting, so you may have an idea of some strategies the participant used previously. If you are not aware of any past quit attempts, ask the participant to share with you the problems they faced when previously attempting to quit. Advise them to keep these failed strategies in mind to avoid repeating the past but also to focus on more helpful strategies. In order to aid the participant in this process, encourage them to complete Section 3 (‘strategies for change’: pages 11-20) of the Workbook over the coming week. Those participants who have never previously attempted to reduce their cannabis use should be invited to spend the time thinking of plausible strategies to use in the future. Those participants without the Workbook should still be encouraged to spend around ten minutes a day writing down their past strategies and give some thought as to more helpful strategies.

4.4.5 Wrap up

Towards the end of the call it is important to ensure that the aims of the second session have been achieved. That is, 1) the participant has made a list of the people, places, situations, thoughts and behaviours that lead them to smoke, and 2) has made a list of the benefits of abstinence that outweighs a list of the benefits of smoking in terms of personal importance.

Before ending the call, ensure that the participant’s telephone details are current (including those of trusted friends) as shown on the Contact Form. Reassure the participant that any information they provide will be kept confidential.
4.4.5.1 Post session

Again, once you have completed this call it will be helpful to review your own performance in the call by using the Clinician Check-List. You will have the opportunity to record your performance in each aspect of the session as a rating from 1 to 5. If a supervisor was present during the call they should also complete the Check-List. In addition, take some time to write any appropriate notes in the PFR that may assist in bridging this session with the next.

Finally, make note of the time for the next session in your own work diary and file the PFR.
5.0 SESSION THREE: STRATEGIES FOR CHANGE

5.1 Approximate Length: 50 minutes

5.2 What you will need for Session Three

1. The Participant Feedback Report (PFR)
2. The Session Three Quick Guide
3. The Session Three Clinician Check-list
4. The ‘Strategy Workbook’
5. The Participant Contact Form

5.3 Aims of Session Three

This session aims to:

1) Reconnect with the participant
2) Assist the participant develop some strategies for dealing with withdrawal
3) Assist the participant to identify their cognitions that lead to them smoking as well as their expectancies surrounding cannabis use
4) Give the participant self-help exercises and organise treatment sessions

5.4 Procedure

This session should be conducted approximately seven days from the date of the second session.

Before making the call, ensure that you are familiar with the PFR. Using the PFR you should be able to establish whether the participant has reached their change date. Importantly, review any notes taken in the previous session to assist with bridging the two sessions and re-familiarising yourself with the participant in a general sense.
5.4.1 Reconnect with the participant (10 minutes)

Follow the procedure outlined in Session 2 for reconnecting with the participant (see section 4.4.1 of this manual). When asking the participant what they recall of the previous session focus on the lessons regarding separating thoughts and behaviours from external events. Explore any barriers that the participant faced in doing this task and attempt to problem solve with them to overcome these barriers. Once you feel rapport has been re-established give an explanation of this session by following the outline below.

Inform the participant that in this session you will discuss strategies for reducing cannabis use and maintaining the reduction as well as providing education on urges and cravings. Those participants with the Workbook should be asked to keep it handy and open to Section three on ‘strategies for change’. The main aims for this session are outlined in the Workbook and it will improve the flow of the call for the participant to be prepared in this way.

5.4.2 Participants who were successful in reducing their cannabis use

This component of Session Three applies to participants that were successful in reducing their cannabis use. Follow the procedure outlined in Session 2 regarding participants who were successful in reducing their use (see section 4.4.2 of this manual). Begin to follow the procedure outlined below once you have congratulated the participant for reducing their cannabis use.

In order to assist the participant in continuing with their reduction attempt it will be helpful to improve their coping skills with some strategies that will assist in maintaining a reduction in their cannabis use.
5.4.2.1 Emergency Plans and Coping Strategies (30 minutes)

The participant will have made a list of the triggers and cues that lead them to smoke in the previous session (also recorded in the PFR). In this session you will be assisting the participant to make a plan to follow when dealing with these triggers. Begin by discussing how participants should expect to be confronted by certain events that would typically lead them to use cannabis. Most importantly, ensure the participant understands that they will be much less likely to give in to these situations if they have a previously prepared plan of attack. These plans should be very simple to follow and cover many situations. Some helpful suggestions might include: to simply leave or somehow change the situation; monitor their thoughts for problematic thinking (rationalising use); or calling a family member or friend for support. In addition to these emergency plans, the participant should be advised of some other general cognitive behavioural techniques they can use to avoid smoking. These techniques are briefly mentioned in Section 4 of the Workbook if the participant wishes to be reminded in the future.

- Distraction – just as our behaviours are influenced by our thoughts, our thoughts are in turn influenced by our behaviours. That is, by focussing on something that does not trigger any cues to smoke cannabis, our thoughts of smoking will be reduced. Advise the participant that they can always try to occupy their mind with other distracting activities such as taking up a hobby, participating in sport, going to the cinema, etc.

- Delaying – the next time a participant is confronted with a really significant episode of craving or withdrawal symptoms, advise the participant to make a serious attempt to wait at least half an hour before giving in to smoking. This is
because a particular urge is not likely to last longer than approximately 30 minutes.

- Decatastrophising – advise the participant to always “keep things in perspective”. That is, when confronted with a particular withdrawal symptom, encourage the participant to compare their symptom with another uncomfortable feeling that they have experienced in the past. In addition, have them ask ‘what is the worst thing that could happen?’ and ‘what is the probability of this happening?’ In this way they can avoid the feeling of being overwhelmed by an urge. As an example, you could encourage them to ask themselves “Is this feeling really all that unbearable? Is it so much worse than having the flu?”

- De-stressing – advise the participant to try some relaxation exercises, even if it is as simple as taking slow deep breathes or getting a massage. Ask them if they have any family or friends that may be helpful in getting the participant to relax.

- Staying healthy – ensure the participant has a healthy appetite and drinks plenty of water. It is common for people who use cannabis regularly to have a poor diet and to prefer sweet and palatable foods. Try to impress upon the participant the importance of getting some exercise, eating healthily and attempting to sleep in a regular pattern. This is because exercise and diet have been linked to elevations in mood. Also, some participants may report feeling unhealthy due to trouble sleeping. Sleeping can be improved by establishing a routine or ritual. In particular, if the participant has mentioned a difficulty with sleeping try to ensure that they: go to bed at the same time each night; avoid activities that could be associated with wakefulness while in bed (such as watching television); and avoid sleeping in or napping during the day.
5.4.2.2 Owning your actions (10 minutes)

Next, let the participant know that you will be taking some time to address their thoughts and the effect that their thoughts have on their behaviours. Begin by illustrating that for many people cannabis use rituals are repeated so often that it becomes automatic. Explain to the participant that hours before many people smoke they will take many different steps and make a series of decisions that unconsciously assist them in smoking. Importantly, get the participant to think about the decisions that they make during the day, no matter how small, and explore whether these decisions are safe or risky in terms of the consequences. Inform the participant that being aware of these decisions is important to assist them in making the effort to avoid the follow through to cannabis use. The next step will be to help the participant compile a list of their own decisions and actions that increase the risk that they use cannabis. If the participant is struggling, give some examples of these decisions, such as: setting aside a time in the day when they could smoke; hanging out with friends that smoke; sitting down in the couch where they would usually smoke; avoiding activity and thus increasing boredom. The participant should be encouraged to use Section 3 (‘strategies for change’: page 20) of the Workbook to keep a record of these decisions and actions. Participants who completed their self-help exercises will be able to provide their list of these decisions. Before moving on, ensure that you attend to each of these decisions as the participant illustrates them. Also, as the participant mentions a decision, record this in their PFR.

5.4.3 Participants who were not successful in reducing their cannabis use

This portion of Session Three applies to participants who mentioned that they were not successful in reducing their cannabis use post change date.
Follow the procedure outlined in Session 2 above regarding unsuccessful participants (see section 4.4.3 of this manual). Begin to follow the procedure outlined below once you have spent some time addressing the participant’s inability to reduce their cannabis use.

At this stage it is likely that the participant does not have adequate coping skills and would benefit by continuing, with time permitting, this session by focussing on the emergency planning and coping strategies (see section 5.4.2.1 above). However, if this is the second occasion that the participant was unsuccessful in reducing their cannabis use, it is likely that they are experiencing significant motivational problems. Here, instead of moving straight into the strategies outlined in this session, you will need to spend more time using reflective listening to highlight why the participant is continuing to use cannabis and focus on the ‘decisional balance’ technique (see section 4.4.2.2 of this manual).

Finally, reschedule the participant’s change date by revisiting section 3.4.5 and 3.4.6 of this manual before attending to the self-help exercises as detailed below.

5.4.4 Self-help exercises (10 minutes)

Once the participant has been provided with some coping strategies, inform them that you want to work on increasing the amount of activities in their day that they find rewarding. Reassure them that you understand that reducing/quitting cannabis is unlikely to be an enjoyable activity and may at times bring on a very negative mood. However, increasing the number of activities that the participant enjoys doing may help fight off the negative feelings associated with reducing/quitting cannabis. Explain that this may be particularly relevant as heavy cannabis use tends to reduce the number and quality of activities that a person may otherwise do in the day. Hence, reducing/quitting
Cannabis use will tend to increase the amount of time in the day for doing other things. Encourage the participant to make a list of activities that they enjoy doing that could replace the times when they would normally use cannabis.

In addition, the participant should be encouraged to read over Section 5 (‘putting it all together’: pages 25 – 30) of the Workbook to help the flow of the next session where relapse prevention techniques will be addressed. This section of the Workbook asks the reader to make a list of rewards to give themselves after putting in the hard work of reducing their cannabis use. These rewards should, of course, not include anything related to cannabis. In addition, they are provided with a short education on some further relapse prevention techniques which will be covered in the next session.

Participants without the Workbook should still make a list of non-cannabis reward options. In addition, insist that the participant spend ten minutes per day thinking about how they usually rationalise their cannabis use (or excuse them when they do use). In this way the participant will be better prepared for the topics covered in the next session.

5.4.5 Wrap up (2 minutes)

Towards the end of the call it is important to ensure that the aims of the third session have been achieved. That is that the participants 1) has a set of emergency plans and strategies to fall on when confronted with a situation where they may be tempted to smoke, and 2) has given some thought as to what decisions they make that lead them to use cannabis and the expectancies they have surrounding cannabis use.

Before ending the call, ensure that the participant’s telephone details are current (including those of trusted friends) as shown on the Contact Form. Reassure the participant that any information they provide will be kept confidential.
5.4.5.1 Post session

Again, once you have completed this call it will be helpful to review your own performance in the call by using the Clinician Check-List. Each of the required tasks in the treatment session will be shown and you will have the opportunity to record your performance as a rating from 1 to 5. If a supervisor was present during the call they should also complete the Check-List. In addition, take some time to write any appropriate notes in the PFR that may assist in bridging this session with the next.

Finally, make note of the time for the next session in your own work diary and file the PFR.
6.0  SESSION FOUR: PUTTING IT ALL TOGETHER

6.1  Approximate Length: 70 minutes

6.2  What you will need for Session Four

1. The Session Four Quick Guide
2. The Session Three Quick Guide
3. The Participant Feedback Report (PFR)
4. The Session Four Clinician Check-list
5. The Strategy Workbook
6. Participant Contact Form

6.3  Aims of Session Four

This session aims to:

1) Affirm that the teachings of the previous sessions were understood
2) Inform the participant on what to expect with possible relapses
3) Assist the participant with some relapse prevention techniques
4) Assist the participant to maintain cannabis reduction after treatment
5) End the treatment and wrap up

6.4  Procedure

This session should be conducted approximately seven days from the date of the third session.

Before making the call, ensure that you are familiar with the PFR. The PFR should enable you to establish whether or not the participant has reached their change date.
Importantly, review any notes taken in the previous session to assist with bridging the two sessions and re-familiarising yourself with the participant in a general sense.

6.4.1 *Reconnect with the participant (10 minutes)*

Follow the procedure outlined in Session Two for reconnecting with the participant (see section 4.4.1 of this manual). Once you feel rapport has been re-established give an explanation of this session by following the outline below.

Inform the participant that in this session you will be discussing relapses and how to prevent these outside of treatment. Those participants with the *Workbook* should be asked to keep it close by and open to Section 5 on ‘putting it all together’. The main aims for this session are outlined in the *Workbook* and it will improve the flow of the call for the participant to be prepared.

6.4.2 *Participants who were successful in reducing their cannabis use*

This component of Session Four applies to participants that were successful in reducing their cannabis use. Follow the procedure outlined in Session Two for participants who were successful in reducing their use (see section 4.4.2 of this manual). Again congratulate the participant for continuing with their reduction and explain you will be assisting the participants in developing some techniques to hopefully prevent any future relapse.

6.4.2.1 *Relapse prevention techniques (20 minutes)*

Inform the participant that although they have been successful in reducing their cannabis use, they may still feel temptation to use cannabis every now and then, sometimes even years later. Further, inform the participant that when people try to reduce their cannabis use, their reduction is not usually linear but instead likely to have
ups and downs. Discuss how relapses occur at different levels, from minor one-off slips to a complete return to previous levels of use or even beyond this. Emphasise that any relapse is dangerous; however, the participant should not give up their reduction attempt if they have a slip. Instead, present possible slip ups as a mistake or temporary set-back that the participant should be able to learn from by adding another high risk situation to their list. Make the analogy of an individual learning a new skill such as riding a bicycle. That is, when learning to ride, you are likely to make mistakes that you can learn from and that you will eventually become more confident in riding without falling off.

Next, advise the participant that you will be helping them learn some of the strategies outlined in Section five (‘putting it all together’: pages 25 – 28) of the Workbook, including:

- **Avoiding rationalising cannabis use** – Inform the participant that people can convince themselves that “it’s OK” to use cannabis “just this once”. Ensure the participant understands that any rationalising of cannabis use should be avoided.

- **Preparing for separation loss or anxiety** – Discuss with the participant that cannabis had a place in their lives and that many individuals may feel a separation loss when reducing/abstaining from cannabis use. Reassure the participant that these feelings will not last. Encourage the participant to remind themselves that there was a time when they did not smoke. Help the participant identify a means to replace the role that cannabis may have had in their life.

- **Self monitoring** – It is important for the participant to remain committed and stay focused on their goal of cannabis reduction / abstinence over time. In the first session the participant was shown how to use the Self Monitoring Cannabis
Use Diary. Encourage the participant that a way to continue reducing cannabis use is to keep monitoring use with the diary. Keeping the diary allows the participant to remain informed of their most successful strategies and identify any patterns in relapses.

- **Giving rewards** – Inform the participant that many people make the mistake of rewarding a success in reducing cannabis use by using cannabis. Assist the participant in devising alternative rewards by providing some examples of rewards that are not related to cannabis use, such as going out to dinner or going shopping. Encourage the participant to use Section 5 (‘putting it all together’: page 28) to help them record some helpful reward options if they have not done so already (as part of their self-help exercises).

### 6.4.2.2 Self reliance and intrinsic motivation (15 minutes)

In order to continue to prevent relapse the participant must be self reliant. In this session you will be helping people to realise that their success in reducing their cannabis use was not because of you, but because of their own behaviours and attitudes. Focus on what the participant has achieved in terms of changing their cannabis use. Inform the participant that these changes were made on their own. Encourage the participant to focus on how they feel about making the changes (including the rewards they set out for achieving them). Highlight that things will improve further if they continuing in the same direction. Ask if the participant has any concerns and address these by offering them the opportunity to revisit any of the material from the previous treatment sessions. The aim is to enhance the participant’s own intrinsic motivation for pursuing their goals. Once the participant starts to feel the benefits of change, they will be more likely to pursue further change. Encourage the participant to make a list of other aspects in
their life that they may also want change in the *Workbook* on Section 6 (‘relapse prevention’; page 31).

### 6.4.2.3 Social support (7 minutes)

Importantly, identify if the participant has access to support for their future needs. Social support has been consistently shown to improve treatment outcomes. They should be encouraged to make a list of people that they can contact in times of need. Preferably, these people should not use cannabis and should be understanding and supportive of the participant’s goals. In addition, ensure the participant that they are welcome to call the CIH anytime in the future and they should include the CIH number in their list.

### 6.4.2.4 Maintaining cannabis reduction in the absence of the treatment (8 minutes)

The participant may find maintaining their abstinence easier to achieve if they have some problem solving skills. Problem solving skills can be improved by following a series of structured steps. That is: 1) defining *exactly* what the problem is; 2) generating possible solutions; 3) selecting the best solution; 4) devising a plan for the solution; 5) acting out the plan; and 6) reviewing the outcome. Encourage the participant to offer an example of a problem they recently faced. If they are unable to think of a problem give the participant an example of an individual who is tempted to use cannabis to help them cope with a critical boss. First, assist the participant to define the problem with as much detail as possible by breaking it down to be very specific. Secondly, generate solutions such as talking with other work members or peers about the situation or sourcing outside help. Thirdly, chose the best solution, say sourcing outside help. Fourthly, devise a plan such as setting aside some time in a difficult day to make a call to the outside help. Finally, the individual would need to act out the plan and review the
outcome. Reassure the participant that with practice, problem solving can be learnt like the skill of driving a car and will eventually be chiefly an automatic process.

6.4.3 Participants who were not successful in reducing their cannabis use

This portion of the Session Four procedure applies to participants who mentioned that they were not successful in reducing their cannabis use post change date.

Follow the procedure outlined in Session 2 above regarding this group of participants (see section 4.4.3 of this manual). Begin to follow the procedure outlined below once you have spent some time addressing the participant’s inability to reduce their cannabis use.

Once the client has expressed exactly what went wrong for them, it will be important to identify some helpful alternative strategies. You may need to revisit some previous material if the participant found a particular strategy difficult (a quick reference of strategies is given in the Session Three Quick Guide). However, if this is the third occasion that the participant was unsuccessful in reducing their cannabis use, it is likely that they are experiencing significant motivational problems. Here, instead of moving straight into strategies you will need to spend more time using reflective listening to highlight why the participant is continuing to use cannabis. Some participants may find reducing their use too difficult because they were not adequately prepared. To assist the participant to be more prepared to make a change in their cannabis use, revisit ‘Doing it: Scheduling the cannabis reduction’ (see section 3.4.6 of this manual). Remind the participant that the biggest hurdle to overcome when reducing cannabis use is the belief that it will be too hard.
Finally, reschedule the participant’s change date by revisiting section 3.4.5 and 3.4.6 of this manual. If time permits and the participant is willing, proceed to cover the relapse prevention techniques detailed in section 6.4.2.1 before moving to end the treatment sessions as detailed below.

6.4.4 Wrap up: End the treatment sessions (4 minutes)

Towards the end of the call it is important to ensure that the aims of the fifth session have been achieved. That is: 1) the participant understands what it means to relapse into cannabis use (ie. that it shouldn’t be catastrophised but is a potentially helpful set-back), 2) has some understanding of relapse prevention techniques that can be used to avoid potential slip ups, and 3) the participant has a sense of self-reliance and some confidence in their ability to maintain these changes in the absence of treatment. For participants who have not managed to reduce their cannabis use you will need to take a different approach to wrap up this final session. It is likely that the participant is experiencing a problem in their life that is difficult to overcome and resulting in their cannabis use. You may need to instead refer the client to additional treatment options in the absence of the CAHL model. In addition, encourage the participants to continue to use the Workbook as a reference to many of the topics covered in these treatment sessions and continue to self monitor by keeping a diary of their cannabis use.

Finally, offer a summary of the four sessions in terms of what the participant has achieved, or not achieved. Include a summary of the techniques that you covered and which were more and which were less successful for the participant. Close the call by attending to any questions the participant has regarding the treatment sessions received. Inform the participant that although the treatment calls are now completed they are always welcome to continue on course by calling the CIH. Encourage the participant to
continue using the *Workbook* and Cannabis Use Self Monitoring Diary as tools to stay focused. Thank the participant for participating in the treatment and remind them that their name and number will remain confidential information.

Before ending the call, ensure that the participant’s telephone details are current (including those of trusted friends) as shown on the Contact Form. Remind the participant that a researcher from NCPIC will be calling to follow up on their experience with the CAHL program.

*6.4.4.1 Post session*

Again, once you have completed this call it will be helpful to review your own performance in the call by using the Clinician Check-List. Each of the required tasks in the treatment session will be shown and you will have the opportunity to record your performance as a rating from 1 to 5. If a supervisor was present during the call they should also complete the Check-List.

As this is the final treatment session, once you have completed making any appropriate notes to the PFR, return the PFR and Contact Form to Peter Gates at NCPIC. The participant’s information will then be stored in a locked filing cabinet at NCPIC for the mandatory period.
7.0 GENERAL ISSUES

7.1 Consent

It is a requirement of the Human Research Ethics Committee at the University of New South Wales that each participant in the CAHL program must have given verbal consent before participating. Further, any participant may withdraw from the program at any time for any reason.

7.2 Participant Contact Form

The researcher will send to you the Participant Contact Form (see Appendix C) along with the Participant Feedback Report (PFR). However, when you receive the contact form it should be kept separately from the PFR so as not to link to the participant’s personal data. Before each session you will need the contact form to ensure you are able to contact the participant at the appropriate time and date. After each session you will need to check that the contact information kept on this form is current.

7.3 The Participant Feedback Report (PFR)

Each participant will have a Participant Feedback Report (PFR) file which should be kept in a secure place to ensure confidentiality (see Appendix D). The PFR will contain all relevant information on the participant’s cannabis use and related factors such as motivations to use, past quit attempts and stages of change. The PFR will also include blank sections specific to individual sessions in the CAHL program. The session procedures occasionally note times when you will need to record certain observations that the participant makes in their PFR (for example their pros and cons of cannabis use). In addition, the dates of the CAHL program sessions and the participant’s
attendance record should be recorded on the PFR. In this way, the PFR can be used to help reconnect with the participants between sessions.

The PFR information will be initially filled out by a researcher from the National Cannabis Prevention and Information Centre (NCPIC) before being mailed to the Cannabis Information and Helpline (CIH) staff. At the conclusion of the CAHL program the CIH will return the PFR to NCPIC in order for the data to be analysed and stored for the mandatory period.

7.4 Self-Monitoring Cannabis Use Diary

One of the main aims of the first session in the CAHL model is to assist the participant in monitoring their cannabis use and withdrawals. A sample diary specifically designed for this purpose is included in the *Quitting Cannabis Workbook* and is replicated in an additional attachment for participants to use called the *Cannabis Use Self-Monitoring Diary* (see Appendix E). The NCPIC researcher will mail both the *Workbook* and the *Diary* to participants at the time the baseline survey was conducted.

7.5 Clinician Checklists

A number of treatment sessions will be supervised by NCPIC staff and CIH staff. These will be chosen at random. In each case it will be the job of the supervisor to record the extent to which the material was covered in each session. It will take a different amount of time to attend to the same section of the manual with different participants. To keep a record of the time taken attending to different aspects of the treatment, the clinician checklist should be completed (see Appendix F). In addition, you will be required to complete the same checklist on your own performance after each session. You are not expected to spend an equal amount of time for each section outlined in the checklist;
however, the lists are designed to ensure a certain amount of standardisation between counsellors.

7.6 Session Quick Guides

Throughout the session procedures above, the ‘Quick Guide’ is frequently referenced. The Quick Guide is a tool that will help you structure each session and achieve all the important goals (see Appendix G). Basically it is a condensed version of the session procedure with some additional tips on how to approach a particular aim in the session. When making a call for any session, you should keep the appropriate quick guide handy so that it can be seen whenever needed during the call.

7.7 Contact procedures and organising treatment sessions

For the first session of the CAHL program to commence, a NCPIC researcher will provide you with the Participant Contact Form (see Appendix D). The Contact Form will contain the participant’s phone numbers and those of a trusted friend or family member for you to make the first call. If the participant is unable to be contacted on the first attempt, wait a few hours to make a second attempt. If the participant remains unreachable, you should attempt to contact the participant’s nominated family members or friend’s number as provided. If the participant still remains unreachable, make a note to call back on the start of your next shift. At the time of your next shift, use the same procedure as above. If the participant remains unreachable, he/she should be taken out of the CAHL program.

Each participant is to complete the four treatment sessions within a four week time frame. It is preferable that the sessions are organised to be one week apart, however this may be too difficult depending on each participant. It may be that, in order for the participant to complete the four treatment sessions, some sessions be arranged to follow
each other more closely. It may be that more than one session needs to be conducted on
the same day due to a participant’s poor availability. In this case, attempt to break up the
sessions up so that the participant has the greatest amount of time to digest the
information gained from one session before moving to the next.

7.8 Unreachable participants and incomplete sessions

At the end of a session during the ‘wrap up’ you may find that a participant has
knowledge that they will be busy or away over the period in which a subsequent session
is intended to be completed. If this is the case, the participant should be reminded that
they can be called at any time in the normal hours of operation of the Cannabis
Information and Helpline (2pm until 11pm). If the participant remains unreachable,
inform the participant that they will be removed from the CAHL program if they can’t
find a way to be contactable by phone within a week of the recommended time for the
session to begin. Additionally, some participants may prematurely end a session by
hanging up the phone. In this case, you should make a note in the PFR and treat the
participant as detailed in the section below on participants wishing to withdraw.

7.9 Participants wishing to withdraw from the CAHL program

If a participant opts to be removed from the program for any reason, they should be
informed that this will not jeopardise their relationship with the CIH, NCPIC or the
University of NSW. The participant will have made some effort to follow the CAHL
program and they should be thanked accordingly and encouraged to continue their
cannabis reduction on their own. In this case, you will need to write a note in the PFR
recording what sessions were not completed. You are requested to then return the PFR
to NCPIC.
7.10 Mandatory Reporting Issues

7.10.1 How to deal with the disclosure of child abuse or other risk of harm

During the CAHL program it is possible that a participant may reveal information regarding child abuse or other risk of harm. If the caller is in NSW, a CIH employee who suspects, on reasonable grounds, that a participant has information regarding these areas is required by law to make a report to the appropriate service (in NSW this is the Department of Community Services). In particular, this reporting is required when the participant mentions that a child:

• is not having their basic needs met (e.g., food, shelter, clothing)
• has psychological needs that are not met or are being treated in a way that could lead to psychological damage
• does not have access to required medical care
• is experiencing physical or sexual abuse or ill-treatment
• is experiencing domestic violence at home that could result in physical or psychological damage to the young person
• is homeless and that this has put them at risk

In the case where the caller is in a state other than NSW, the mandatory requirements of the counsellor may change. In this case the counsellor should attend to the standard operating procedures set out by Lifeline, Australia.

7.10.2 How to deal with the disclosure of plans to seriously hurt self or others

During the CAHL program the participant may reveal information that they plan to seriously hurt themselves, or someone else. This is a very important issue and you should encourage the participant to end the session and inform the participant that you
will need to discuss this issue further. If you feel that the discussion cannot wait, the session should be discontinued at that point. At the time of discussion you will need to follow the *Lifeline* standard operating procedures for assisting a suicidal caller.
REFERENCES


APPENDIX A: PARTICIPANT INFORMATION AND CONSENT FORM

THE UNIVERSITY OF NEW SOUTH WALES

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM

RANDOMISED CONTROL TRIAL OF THE CANNABIS ASSISTANCE LIFELINE PROJECT

You are invited to participate in a trial of a telephone-based cannabis intervention service designed to help people reduce their cannabis use. You were selected to be a possible participant as you have shown a desire to reduce your cannabis use and are over the age of 16 years.

If you decide to participate, you will be asked to be called back at a convenient time by a researcher from the National Cannabis Prevention and Information Centre (NCPIC) in order to complete a short interview. The interview will include questions about your own cannabis and other drug use as well as your mental and physical health. Following this interview you will be randomly selected to either: 1) take part in a brief telephone-based cannabis intervention commencing at your soonest convenience, or 2) take part in the intervention after a waiting period of approximately three months. This intervention will involve four personal counselling sessions over four weeks conducted by trained counsellors from the Cannabis Information and Helpline and is supplemented by a self-help workbook. In addition, you will be asked to be followed up three times over the phone by a researcher from NCPIC after the intervention for a period of three months to monitor your progress.
For participating in this trial you will be reimbursed a total of $60 for your time and any out of pocket expenses. Reimbursement of $30 will be made on completion of the second and third follow up interviews.

You will not be required to give your name at any time before, during, or after the interview however it is required that you give details of your phone number and/or address for the purposes of being called back for interview and/or receiving mail-out self-help materials on changing your cannabis use. Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results, which will be in report format. Nobody, other than the researchers, will have direct access to the information gained in this interview.

Your decision whether or not to participate will not prejudice your future relations with the University of New South Wales, or the Cannabis Information and Helpline. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice.

Complaints may be directed to the Ethics Secretariat, The University of New South Wales, SYDNEY 2052 AUSTRALIA (phone 9385 4234, fax 9385 6648, email ethics.sec@unsw.edu.au). Any complaint you make will be investigated promptly and you will be informed out the outcome.

If you have any questions, please feel free to ask us. If you have any additional questions later, Mr Peter Gates can be contacted on 9385 0269 and will be happy to answer them.

If you are interested you may be given a copy of this form to keep.
APPENDIX B: PARTICIPATION SCREENER

Identification Code: ____________

1) How old are you? ________________
   [* Must be at least 16 years of age]

2) How many days have you used cannabis in the last month (30 days)?
   __________________
   [* Must have used at least once in the last 30 days]

3) Are you currently participating in any alcohol or drug treatment? Or
   have you participated in any cannabis treatment in the last three months?
   Yes ☐ 1 No ☐ 0
   [* Must not have participated in any recent other alcohol or drug
   treatment]
**APPENDIX C: PARTICIPANT CONTACT FORM**

Identification Code: 

**Follow Up information**

Home Phone 1) ________________ 2) ________________

Mobile 1) ________________ 2) ________________

Name of friend ________________ Number ________________

Name of family member ________________ Number ________________

Other name ________________ Number ________________

Other name ________________ Number ________________

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APPENDIX D: PARTICIPANT FEEDBACK REPORT (PFR)

PARTICIPANT FEEDBACK REPORT

Client ID: __ __ __ __

Age: __ __ years       Gender:   M □       F □

Details of participants cannabis use

How long has the participant been using cannabis?       In years: __________

Time Line Follow Back Info

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Money spent on cannabis       Cost / Week $________

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
Cannabis Dependence

Details regarding scores on the Severity of Dependence Scale

Cannabis use was out of control 

Prospect of missing a smoke made you very anxious or worried 

You worried about your use of cannabis 

You wished you could stop 

You would find it 

to stop or go without cannabis

SDS SCORE _____ / 15

[0 – 3: nil, 4-6: mild, 7-9: moderate, 10-12: substantial, 13-15: severe]

- 18 -24 yrs -> 29.8% of users are dependent (5.9% of population)
- 25-34 yrs -> 19.2% of users are dependent (2.4% of population)
- 35-44 yrs -> 12.3% of users are dependent (0.9% of population)
- 45-54 yrs-> 2.9% of users are dependent (0.04% of population)
- 55-64 yrs -> less than 1% of users are dependent

Attempts at reducing Cannabis use

Number of attempts to reduce cannabis use without professional help in the last 12 months

Any reduction strategies:
Motivations and reasons to use Cannabis

Motivation(s) for initial cannabis use: ______________________

Motivation(s) for most recent cannabis use: ______________________

Motivation(s) for typical cannabis use: ______________________

Participant state of change

I am not thinking of cutting down or stopping my cannabis use □

I would like to change my cannabis use but I’m not sure if I’m ready □

I am preparing myself to change my cannabis use □

I am in the process of cutting down my cannabis use now □

I am in the process of stopping my cannabis use now □

I have quit my cannabis use □
SESSION ONE

Did the participant access treatment after the Baseline survey? YES ☐ NO ☐

Is the participant currently taking any medication? YES ☐ NO ☐

Does the participant have the Workbook handy? YES ☐ NO ☐

Reported problems with cannabis use?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Reported experiences with cannabis withdrawal or associated problems?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Any needed information?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Notes from Session One
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Change Date  _ _ / _ _ / _ _ _ _
SESSION TWO

Did the participant access any treatment after Session 1? YES □ NO □

Is the participant currently taking any medication? YES □ NO □

Does the participant have the Workbook handy? YES □ NO □

Notes regarding reconnecting with the participant and issues with self-help exercises

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Did the participant attempt the self-help exercises from Session 1? YES □ NO □

Was the participant successful in reducing their cannabis use? YES □ NO □

Participant’s reported triggers to smoking

1

2

3

4

5
Participant’s reported pros for smoking
1_______________________________________________________weighting _ _/10
2_______________________________________________________weighting _ _/10
3_______________________________________________________weighting _ _/10
4_______________________________________________________weighting _ _/10
5_______________________________________________________weighting _ _/10
6_______________________________________________________weighting _ _/10

TOTAL _ _/ _ _

Participant’s reported cons for smoking
1_______________________________________________________weighting _ _/10
2_______________________________________________________weighting _ _/10
3_______________________________________________________weighting _ _/10
4_______________________________________________________weighting _ _/10
5_______________________________________________________weighting _ _/10
6_______________________________________________________weighting _ _/10

TOTAL _ _/ _ _

Notes from Session Two
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

Revised Change Date?   _ _/ _ _/ _ _ _ _
SESSION THREE

Did the participant access any treatment after Session 2? _______YES □ NO □

Is the participant currently taking any medication? _____________YES □ NO □

Does the participant have the Workbook handy? YES □ NO □

Notes regarding reconnecting with the participant and issues with self-help exercises

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Did the participant attempt the Self-help exercises from Session 2? YES □ NO □

Was the participant successful in reducing their cannabis use? YES □ NO □

Participant’s high risk situations
1____________________________________________________________________
2____________________________________________________________________
3____________________________________________________________________
4____________________________________________________________________
5____________________________________________________________________
Possible high risk situation strategies
1
2
3
4
5

Participant’s reported actions/decisions that lead to cannabis use (‘owning your own actions’)

Discussion on enjoyable activities (Homework for next session)

Notes from Session Three

Revised Change Date? _ _ / _ _ / _ _ _ _
SESSION FOUR

Did the participant access any treatment after Session 3? YES □ NO □

Is the participant currently taking any medication? YES □ NO □

Does the participant have the Workbook handy? YES □ NO □

Notes regarding reconnecting with the participant and issues with self-help exercises

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Did the participant attempt the Self-help exercises from Session 3? YES □ NO □

Was the participant successful in reducing their cannabis use? YES □ NO □

Notes on relapse prevention

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Notes from Session Four

________________________________________________________________________
________________________________________________________________________
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________________________________________________________________________

Revised Change Date? _ _ / _ _ / _ _ _ _
APPENDIX E: CANNABIS USE SELF MONITORING DIARY

<table>
<thead>
<tr>
<th>Date &amp; Time</th>
<th>Situation (where/ with whom)</th>
<th>Strength of urge/desire</th>
<th>Thoughts and feelings</th>
<th>Outcomes (actions, challenges, thoughts, consequences)</th>
<th>Amount Smoked</th>
<th>Mastery rating (0 – 10)</th>
</tr>
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<tbody>
<tr>
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</tbody>
</table>
## APPENDIX F: CLINICIAN CHECKLIST

### CLINICIAN CHECKLIST - SESSION ONE: CANNABIS AND THE PARTICIPANT

(client code _ _ _ _)

<table>
<thead>
<tr>
<th>Manual Ref.</th>
<th>Task to be completed</th>
<th>Suggested time</th>
<th>Actual time</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1</td>
<td>Introduce yourself and establish rapport</td>
<td>5</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>3.4.1</td>
<td>Review the main points from the consent form</td>
<td>2</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>3.4.1</td>
<td>Introduce Workbook</td>
<td>2</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>3.4.2</td>
<td>Explored the participant’s problem situation</td>
<td>8</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>3.4.2</td>
<td>Introduce the CAHL model</td>
<td>2</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>3.4.3</td>
<td>Review the PFR : SDS score</td>
<td>10</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>3.4.3</td>
<td>Review the PFR: Costs of using cannabis</td>
<td>10</td>
<td>/ 5</td>
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</tr>
<tr>
<td>3.4.3</td>
<td>Educate regarding Cannabis withdrawals</td>
<td>3</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>3.4.4</td>
<td>Provided any needed information</td>
<td>5</td>
<td>/ 5</td>
<td></td>
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<tr>
<td>3.4.5</td>
<td>Make a change date &amp; organise future sessions</td>
<td>10</td>
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<td>3.4.6</td>
<td>Schedule reduction in cannabis use</td>
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<tr>
<td>3.4.7</td>
<td>Self-help exercises (Workbook Section 2&amp;4)</td>
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<tr>
<td>3.4.7</td>
<td>Self-help exercises (Self monitoring diary)</td>
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<td>/ 5</td>
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<td>3.4.8</td>
<td>Wrap up</td>
<td>2</td>
<td>/ 5</td>
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<tr>
<td>TOTALS</td>
<td></td>
<td>74</td>
<td>/70</td>
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</tbody>
</table>

| PFR         | Remembered to ask about previous treatment and/or medication? | yes | no |

### RATING SYSTEM

1. Indicates the component was not delivered, or not delivered effectively in that session
2. Indicates the component was delivered, but only briefly mentioned
3. Indicates the component was mostly covered
4. Indicates the component was fully covered
5. Indicates the component was very effectively and completely delivered
## CLINICIAN CHECKLIST - SESSION TWO: PREPARING FOR CHANGE

(client code _ _ _ _)

<table>
<thead>
<tr>
<th>Manual Ref.</th>
<th>Task to be completed</th>
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</thead>
<tbody>
<tr>
<td>4.4.1</td>
<td>Reconnect with the participant</td>
</tr>
<tr>
<td>4.4.1</td>
<td>Discuss self-help exercises</td>
</tr>
<tr>
<td>4.4.2</td>
<td>Congratulate participants who successfully reduced their cannabis use</td>
</tr>
<tr>
<td>4.4.3</td>
<td>*Spend time addressing what went wrong for participants unable to reduce their use</td>
</tr>
<tr>
<td>4.4.3</td>
<td>*Educate participant regarding motivations</td>
</tr>
<tr>
<td>4.4.3.1</td>
<td>*Affirm that change is possible (Beck’s ABC model)</td>
</tr>
<tr>
<td>3.4.5/6</td>
<td>*Reset change date and reschedule reduction</td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>Manual Ref.</th>
<th>Task to be completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.2.1</td>
<td>List triggers and cues to cannabis use</td>
</tr>
<tr>
<td>4.4.4</td>
<td>Decisional balance</td>
</tr>
<tr>
<td>4.4.4</td>
<td>Self-help exercises - Act out a benefit of abstinence</td>
</tr>
<tr>
<td>4.4.4</td>
<td>Self-help exercises – Workbook Section 3</td>
</tr>
<tr>
<td>4.4.5</td>
<td>Self-help exercises - Identify ineffective strategies</td>
</tr>
<tr>
<td>4.4.5</td>
<td>Wrap up</td>
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</table>

**Then with time permitting**

<table>
<thead>
<tr>
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<th>Task to be completed</th>
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<tr>
<td>TOTALS</td>
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<tr>
<td>PFR</td>
<td>Remembered to ask about previous treatment and/or medication?</td>
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<th>Suggested time</th>
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<tr>
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<td>62/92*</td>
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</table>

PFR: Remembered to ask about previous treatment and/or medication?

- yes
- no

---

**RATING SYSTEM**

1. Indicates the component was not delivered, or not delivered effectively in that session
2. Indicates the component was delivered, but only briefly mentioned
3. Indicates the component was mostly covered
4. Indicates the component was fully covered
5. Indicates the component was very effectively and completely delivered
## CLINICIAN CHECKLIST - SESSION THREE: STRATEGIES FOR CHANGE

(client code _ _ _ _)

<table>
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<tr>
<th>Manual Ref.</th>
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<th>Actual time</th>
<th>Rating</th>
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<td>Reconnect with the participant</td>
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<td>5.4.1</td>
<td>Discuss self-help exercises</td>
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</tr>
<tr>
<td>5.4.2</td>
<td>Congratulate participants who successfully reduced their cannabis use</td>
<td>5</td>
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**OR**

<table>
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<th>Suggested time</th>
<th>Actual time</th>
<th>Rating</th>
</tr>
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<td>5.4.3</td>
<td>*Spend time addressing what went wrong for participants unable to reduce their use on this occasion</td>
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<td>/5</td>
<td></td>
</tr>
<tr>
<td>4.4.3</td>
<td>*Educate participant regarding motivations</td>
<td>5</td>
<td>/5</td>
<td></td>
</tr>
<tr>
<td>4.4.3.1</td>
<td>*Affirm that change is possible (Beck’s ABC model)</td>
<td>5</td>
<td>/5</td>
<td></td>
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<tr>
<td>4.4.2.2</td>
<td>**If necessary; revisit the decisional balance for participants unable to reduce their use for a second time</td>
<td>10</td>
<td>/5</td>
<td></td>
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</table>

3.4.5/6  *Reset change date and reschedule reduction | 15

### Then with time permitting

<table>
<thead>
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<th>Manual Ref.</th>
<th>Task to be completed</th>
<th>Suggested time</th>
<th>Actual time</th>
<th>Rating</th>
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<tbody>
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<td>Discuss high risk situations and emergency plans</td>
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<tr>
<td>5.4.2.1</td>
<td>High risk situation strategies - Distraction</td>
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<tr>
<td>5.4.2.1</td>
<td>High risk situation strategies - Delaying</td>
<td>5</td>
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<tr>
<td>5.4.2.1</td>
<td>High risk situation strategies - Decatastrophising</td>
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<td>5.4.2.1</td>
<td>Discuss high risk situation strategies – De-stressing</td>
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<td>5.4.2.1</td>
<td>Discuss high risk situation strategies – Staying healthy</td>
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<td>5.4.2.2</td>
<td>Owning your actions</td>
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<td>5.4.4</td>
<td>Self-help exercises - Creating a list of rewarding activities</td>
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<td>Self-help exercises - <em>Workbook Section 5</em></td>
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<td>5.4.5</td>
<td>Wrap up</td>
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**TOTALS**

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<th></th>
<th>67</th>
<th>97*</th>
<th>107**</th>
<th>/65</th>
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**PFR**

Remembered to ask about previous treatment and/or medication?

<table>
<thead>
<tr>
<th></th>
<th>yes</th>
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* This component is applicable to participants unable to reduce their cannabis use on this occasion

** This component is applicable to participants unable to reduce their cannabis use on multiple occasions

79
### CLINICIAN CHECKLIST - SESSION FOUR: PUTTING IT ALL TOGETHER

(client code _ _ _ _)

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<th>Rating</th>
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<td>6.4.1</td>
<td>Reconnect with the participant</td>
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<td>5/5</td>
</tr>
<tr>
<td>6.4.1</td>
<td>Discuss self-help exercises</td>
<td>5</td>
<td></td>
<td>5/5</td>
</tr>
<tr>
<td>6.4.2</td>
<td>Congratulate participants who successfully reduced their cannabis use</td>
<td>5</td>
<td></td>
<td>5/5</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4.3</td>
<td>*Spend time addressing what went wrong for participants unable to reduce their use</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4.3</td>
<td>*Educate participant regarding motivations</td>
<td>5</td>
<td></td>
<td>5/5</td>
</tr>
<tr>
<td>4.4.3.2</td>
<td>*Affirm that change is possible (Beck’s ABC model)</td>
<td>5</td>
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<tr>
<td>5.4.2.1</td>
<td>**If necessary; Revisit high risk situation strategies</td>
<td>20</td>
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<td></td>
</tr>
<tr>
<td>3.4.5/6</td>
<td>*Reset change date and reschedule reduction</td>
<td>15</td>
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**Then with time permitting**

<table>
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<th>Actual time</th>
<th>Rating</th>
</tr>
</thead>
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<td>6.4.2.1</td>
<td>Relapse prevention techniques: Rationalising</td>
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<td>5/5</td>
</tr>
<tr>
<td>6.4.2.1</td>
<td>Relapse prevention techniques: Preparing for loss</td>
<td>5</td>
<td></td>
<td>5/5</td>
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<tr>
<td>6.4.2.1</td>
<td>Relapse prevention techniques: Self monitoring</td>
<td>5</td>
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<td>5/5</td>
</tr>
<tr>
<td>6.4.2.1</td>
<td>Relapse prevention techniques: Self rewards</td>
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<td></td>
<td>5/5</td>
</tr>
<tr>
<td>6.4.2.2</td>
<td>Encourage self efficacy in the participant</td>
<td>15</td>
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<td>5/5</td>
</tr>
<tr>
<td>6.4.2.3</td>
<td>Identify participant’s social support network</td>
<td>7</td>
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<td>5/5</td>
</tr>
<tr>
<td>6.4.2.4</td>
<td>Bolster participant’s problem solving skills</td>
<td>8</td>
<td></td>
<td>5/5</td>
</tr>
<tr>
<td>6.4.4</td>
<td>Offer referrals to additional treatment where appropriate</td>
<td>2</td>
<td></td>
<td>5/5</td>
</tr>
<tr>
<td>6.4.4</td>
<td>Field last questions and inform participant about research follow up</td>
<td>2</td>
<td></td>
<td>5/5</td>
</tr>
</tbody>
</table>

| TOTALS      |                                                                                       | 69             | 99*          | 119**  |

| PFR         | Remembered to ask about previous treatment and/or medication?                         | yes            | no           |

* This component is applicable to participants unable to reduce their cannabis use on this occasion

** This component is applicable to participants unable to reduce their cannabis use on multiple occasions
APPENDIX G: SESSION QUICK GUIDES

SESSION ONE QUICK GUIDE

- **Introduce yourself and establish rapport**
  - “Hi <participant’s name>, my name is <your name> and I am calling you today because you have recently agreed to participate in our telephone-based brief cannabis intervention. Do you recall speaking with the Cannabis Information Helpline or a research officer from the National Cannabis Prevention and Information Centre about this?”

- **Review the main points from the consent form**
  - All information provided is confidential (except child abuse or self and other harm)
  - There is no guarantee of direct benefit, however participants will be reimbursed on completion of follow up interviews conducted by NCPIC
  - The participant can withdraw from the study at any time
  - Use this time to ask the caller if they have been on any medication or treatment since speaking with the researcher

- **Introduce the Quitting Cannabis Workbook**
  - Ensure the participant has the Workbook or something to write on at hand

- **Explore the participant’s cannabis use problems and reason for participating**
  - Focus on personal meaning; “How does that make you feel?”
  - Possible cannabis-related problems: financial, employment, legal, family relationship and support problems

- **Introduce the CAHL model**
  - Inform the participant that by working with their thoughts associated with cannabis use they will begin to change their patterns of cannabis use, help them cope with the idea of reducing their use, build their coping skills and reduce any negativity they may feel when reducing

- **Review the PFR with the participant**
  - Illustrate the participant’s SDS score (pg 4)
  - Illustrate where the participant falls in relation to dependence frequencies in Australia (taken from the 1997 NSMHWB)
    - 18 -24 yrs -> 29.8% of users are dependent (5.9% of population)
    - 25-34 yrs -> 19.2% of users are dependent (2.4% of population)
    - 35-44 yrs -> 12.3% of users are dependent (0.9% of population)
    - 45-54 yrs-> 2.9% of users are dependent (0.04% of population)
    - 55-64 yrs -> less than 1% of users are dependent
    - TOTAL:21% [23% male, 16.4% female] (1.5% population; 2.3% male, 0.7% female)
- Highlight to the participant how much money they are spending on cannabis in an average week

- **Inform the participant that you would like to talk more about withdrawal symptoms**
  - “Withdrawal symptoms are any thoughts and feelings that you may experience when you reduce your cannabis use after long periods of regular use. They can be both physical – like sleeping problems, sweating, loss of appetite, shaking – and psychological – like irritability, trouble concentrating, anxiety, confusion, depression, anger and urges to smoke. Different people experience different withdrawal symptoms, but they are never dangerous or harmful” (pg 2)

- **Ask the participant if they have any questions and provide the answers**
  - Ensure that the participant does not have any concerns about the future or following treatment sessions

- **Make a change date and schedule their reduction**
  - Tell the participant to begin reducing cannabis use by following a scheduled reduction (reduce usual number of smokes by two thirds rationed evenly across a sixteen hour day)
  - E.g. 24 cones per day is reduced to 16 in a sixteen hour day, that is one per hour
  - Have the participant keep a record of their change date (pg 25)

- **Give the participant self-help exercises**
  - Section 2 of the *Workbook*
  - *Cannabis Use Self Monitoring Diary*
  - Section 4 in the *Workbook* (the withdrawal diary)
SESSION TWO QUICK GUIDE

- **Reconnect with the participant**
  - Spend some time re-establishing rapport, ask the caller how their week has been
  - Determine if the participant recalls the first session and briefly summarise it
  - Ask if the participant has been on any medication or been to any treatment in the last week

- **Discuss the participant’s self-help exercises**
  - Did the participant complete Section 2 and Section 4 of the *Workbook*?
  - Did the participant make use of the Cannabis Use Self-Monitoring Diary?
  - Discuss the barriers to completing self-help exercises for those who did not make an attempt

- **If appropriate, spend some time congratulating the participant on their success in reducing their cannabis use**
  - Reinforce the positives for not smoking (Improvements in finance, employment, family relationship, time management, physical health?)

  OR

- **If appropriate, spend some time discussing why the participant was unable to reduce their cannabis use**
  - Discuss the situation of use, the people involved and the participant’s coping skills
  - Was the participant using the diary?
  - Talk briefly about motivations (they often compete and fluctuate in importance) Cognitive restructuring: for those participants who are having a hard time believing change is possible.
  - Spend some time talking affirming that change is possible (Beck’s ABC model)
  - Reset change date and reschedule reduction

- **Identify the participant’s triggers for smoking** *(Workbook pg 6)*
  - Internal (feeling tired, feeling like you need a lift, wanting to relax)
  - External (being offered cannabis, going to a smoker’s party)
  - Talk briefly about urges (they do not need to be acted on and will pass)

- **Outweigh benefits of smoking with benefits of abstinence (decisional balance)** *(pg 9)*
  - Go through the pros and cons of smoking with the caller
  - Be sure that the participant gives each benefit an ‘importance rating’ from 0 – 10 and then total them
  - Increase weight or personal meaning of the cons and/or decrease weight of pros
  - Go through the bigger number with the caller, asking what it means for them

- **Give the participant self-help exercises**
  - Assist the participant in acting out an important benefit of not smoking
  - Instruct the participant to complete Section 3 of the *Workbook*
  - Ensure the participant does not list any of their past ineffective reduction strategies (see the PFR)
• Discuss the strategy for the participant’s continued reduction □
  - If the participant has been successful in reducing encourage reducing by a further third
  - If the participant was not successful in reducing encourage them to try again by the same strategy
SESSION THREE QUICK GUIDE

- **Reconnect with the participant**
  - Spend some time re-establishing rapport, ask the caller how their week has been
  - Determine if the participant recalls the second session
  - Ask if the participant has been on any medication or been to any treatment in the last week

- **Discuss the participant’s self-help exercises**
  - Did the participant manage to act out any of the benefits of being a non-smoker?
  - Did the participant complete Section 3 of the *Workbook*?
  - Discuss the barriers to completing self-help exercises for those who did not make an attempt

- **If appropriate, spend some time congratulating the participant on their success in reducing their cannabis use**
  - Reinforce the positives for not smoking (Improvements in finance, employment, family relationship, time management, physical health?)

  OR

- **If appropriate, spend some time discussing why the participant was unable to reduce their cannabis use**
  - Discuss the situation of use, the people involved and the participant’s coping skills
  - Was the participant using the diary?
  - Talk briefly about motivations (they often compete and fluctuate in importance) Cognitive restructuring: for those participants who are having a hard time believing change is possible.
  - Spend some time talking affirming that change is possible (Beck’s ABC model)
  - If this is the second time the participant was unable to reduce, revisit the ‘decisional balance’ technique
  - Reset change date and reschedule reduction

- **Discuss high-risk situations, emergency planning and coping strategies**
  - Ensure the participant has plans to help prevent use in their most dangerous triggers and high risk situations (pg 16)
  - Define urges if not done previously (pg 17) and introduce the 4 D’s as strategies to use during an urge (pg 21)
  - Distraction: occupy time with non-cannabis related activities
  - Delaying: put off smoking for half an hour when confronted with a craving
  - Decatastrophising: put the intensity of craving experiences into perspective by comparing them to other uncomfortable situations
  - De-stressing: take up a relaxing activities (yoga, massage) to reduce their stress levels
  - Staying healthy: take note of the health gains for not smoking
• Discuss “owning your own actions” (Workbook pg 18-20)
  - Help the participant improve their awareness of their thoughts and actions that lead them to use cannabis
  - Explain how these thoughts can be automatic as well as ‘risky’ or ‘safe’
  - Help the participant to list some automatic ‘risky’ decisions they have made in the past (pg 20)

• Give the participant self-help exercises
  - Help the client make a list of enjoyable activities to help replace time spent using cannabis (not in workbook)
  - Section 5 of the Workbook

• Discuss the strategy for the participant’s continued reduction
  - If the participant has been successful in reducing encourage reducing by a further third
  - If the participant was not successful in reducing encourage them to try again by the same strategy
SESSION FOUR QUICK GUIDE

- **Reconnect with the participant**
  - Discuss the barriers to completing self-help exercises for those who did not make an attempt
  - Determine if the participant recalls the third session
  - Ask if the participant has been on any medication or been to any treatment in the last week

- **Discuss the participant’s self-help exercises**
  - Did the participant spend any time thinking of some rewarding activities?
  - Did the participant complete Section 5 of the *Workbook*?
  - Discuss the barriers to completing self-help exercises for those who did not make an attempt

- **If appropriate, spend some time congratulating the participant on their success in reducing their cannabis use**
  - Reinforce the positives for not smoking (Improvements in finance, employment, family relationship, time management, physical health?)

  OR

- **If appropriate, spend some time discussing why the participant was unable to reduce their cannabis use**
  - Discuss the situation of use, the people involved and the participant’s coping skills
  - Was the participant using the diary?
  - Talk briefly about motivations (they often compete and fluctuate in importance)
  - Spend some time affirming that change is possible (Beck’s ABC model)
  - If this is the second time the participant was unable to reduce, revisit the ‘decisional balance’ technique and if necessary, revisit emergency planning and coping strategies
  - Reset change date and reschedule reduction

- **Cover relapse prevention techniques** *(Workbook pg 26 – 28)*
  - Introduce the section by talking about slip ups and how any relapse is dangerous but should be used as a lesson
  - Rationalising: be aware of times when cannabis use is thought to be OK
  - Separation loss: be aware of the role cannabis played in life and the void that may be left when reducing use
  - Self monitoring: use the Cannabis Use Self-Monitoring Diary (talk about patterns and trends of success)
  - Self rewards: think of non-cannabis related rewards for celebrating success in reducing cannabis (pg 28)

- **Focus on establishing self efficacy and confidence in the client**
- Highlight that the participant should own the changes they have made with a feeling of mastery over a challenging task. Assist the participant to make a list of other areas in their life that they could now focus on changing

• **Identify social support contacts that the client can call when needed**

* Help the client establish a structured way of dealing with problems

- Introduce the 6 step problem solving guide as a further technique that can be used to prevent relapse
- Define each of the six steps using a problem that lead the participant to use cannabis in the past
- 1) Defining *exactly* what the problem is; 2) Generating possible solutions; 3) Selecting the best solution; 4) Devising a plan for executing the solution; 5) Acting out the plan; and 6) Reviewing the outcome

• **Wrap up the treatment sessions**

- Offer referral to additional treatment where necessary
- Summarise what has been achieved or not achieved during the sessions
- Field any last questions from the participant
- Determine a time for the researcher to call for the first follow up and remind the participant that it is paid ($60)

• **Discuss the strategy for the participant’s continued reduction**

- If the participant has been successful in reducing encourage reducing by a further third
- If the participant was not successful in reducing encourage them to try again by the same strategy
APPENDIX D:

PROJECT CAHL PARTICIPANT SURVEY
Project Cannabis Assistance Helpline: Participant Survey

Client ID: ________ Interview Date: ___/___/2009

BASELINE □ 4-WEEK □ 12-WEEK □

If appropriate: Eligibility Check

How many days have you used cannabis in the last month (30 days)?
_____________

Are you currently participating in any alcohol or drug treatment? Yes □ No □

Are you currently taking any psychiatric medication for any psychiatric illness? Yes □ No □

What is this medication for? _________________

Have you been hospitalised for this illness before? Yes □ No □

Was this illness brought on through the use of cannabis? Yes □ No □

Section 1: Demographics

1 Which sex are you? Male □ Female □

2 How old are you? _________________ years

3 What is your main source of income?

   Full-time employment □
   Part-time employment □
   Temporary benefit (e.g. sickness, unemployment,) □
   Pension (e.g. aged, disability) □
   Student allowance □
   Dependant on others □
   Retirement fund □
   Crime (property/dealing/sex work/other) □
   Other (specify) _________________ □
   Not stated/not known/inadequately described □
4  Approximately how much income do you earn in a year from this occupation?

$1 - $6,000  ☐
$6,001 - $34,000($650/wk)  ☐
$34,001 - $80,000($1500/wk)  ☐
$80,001 - $180,000($3500/wk)  ☐
$180,000+  ☐

5  What is the highest level of education that you have completed? (NCHSR)

  Primary school only  ☐
  Up to and including year 10  ☐
  Up to and including year 12  ☐
  Diploma or trade certificate  ☐
  Attended university  ☐
  Completed undergraduate degree  ☐
  Completed postgraduate degree  ☐

The next questions are to get some details about your history of cannabis use

6  a) Firstly, how old were you when you \text{first tried} cannabis (marijuana, grass, hash, pot)?

   Age in years: __________

   b) How old were you when you first started using cannabis regularly (at least weekly)

   Age in years: __________
Now I’m going to ask you briefly about some other types of drugs. Remember this information will be kept confidential.

a) Firstly, have you ever used ________ [drug]?

b) How many days did you use ________ [drug] in the past 90 days?

<table>
<thead>
<tr>
<th>Question</th>
<th>Drug</th>
<th>a) Ever used?</th>
<th>b) 90 day frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Alcohol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td>Tobacco/cigarettes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.3</td>
<td>Ecstasy</td>
<td></td>
<td></td>
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<tr>
<td>7.4</td>
<td>Methamphetamine/Amphetamines (speed, ice, crystal)</td>
<td></td>
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</tr>
<tr>
<td>7.5</td>
<td>Cocaine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.6</td>
<td>Heroin or other opioids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.7</td>
<td>Hallucinogens (trips, LSD, acid, magic mushrooms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.8</td>
<td>Pharmaceuticals for non-medical purposes (e.g. painkillers, tranquillisers, benzodiazepines, steroids)</td>
<td></td>
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<tr>
<td>7.9</td>
<td>Designer drugs such as ketamine, GHB</td>
<td></td>
<td></td>
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<tr>
<td>7.10</td>
<td>Inhalants (e.g. solvents, aerosols, glues, petrol)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8 a) Do you usually mix your cannabis with tobacco?  
   Yes ☐ 1  No ☐ 0

b) What percentage of the joint is tobacco?  ______________

9 a) I typically buy _______ (number of grams) per week / fortnight / month.

b) This typically costs $________.

c) I typically smoke _________ Cones / Joints per day.

d) On the days that I smoke cannabis, I am high/stoned for approximately _____ hrs
<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>
11 SEVERITY OF DEPENDENCE SCALE

The next five questions refer to the last three months. Over the last three months ….
(Read out questions and response options)

a. Did you ever think your use of cannabis was out of control?

Never or almost never □ 0
Sometimes □ 1
Often □ 2
Always or nearly always □ 3

b. Did the prospect of missing a smoke make you very anxious or worried?

Never or almost never □ 0
Sometimes □ 1
Often □ 2
Always or nearly always □ 3

c. How much did you worry about your use of cannabis?

Never or almost never □ 0
Sometimes □ 1
Often □ 2
Always or nearly always □ 3

d. Did you wish you could stop?

Never or almost never □ 0
Sometimes □ 1
Often □ 2
Always or nearly always □ 3

e. How difficult would you find it to stop or go without cannabis?

Not difficult □ 0
Quite difficult □ 1
Very difficult □ 2
Impossible □ 3
12 Cannabis Motives

I would like to now go over the reasons people use cannabis. What are the main reason(s) that you used cannabis (a) the first time? (b) the most recent time? and (c) typically?

<table>
<thead>
<tr>
<th>Reason</th>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is exciting</td>
<td>☐1</td>
<td>☐1</td>
<td>☐1</td>
</tr>
<tr>
<td>It is fun</td>
<td>☐2</td>
<td>☐2</td>
<td>☐2</td>
</tr>
<tr>
<td>I like the feeling</td>
<td>☐3</td>
<td>☐3</td>
<td>☐3</td>
</tr>
<tr>
<td>To get high</td>
<td>☐4</td>
<td>☐4</td>
<td>☐4</td>
</tr>
<tr>
<td>To forget my worries/problems</td>
<td>☐5</td>
<td>☐5</td>
<td>☐5</td>
</tr>
<tr>
<td>To cheer me up</td>
<td>☐6</td>
<td>☐6</td>
<td>☐6</td>
</tr>
<tr>
<td>To help me when I feel depressed</td>
<td>☐7</td>
<td>☐7</td>
<td>☐7</td>
</tr>
<tr>
<td>So I won’t feel left out</td>
<td>☐8</td>
<td>☐8</td>
<td>☐8</td>
</tr>
<tr>
<td>To fit in</td>
<td>☐9</td>
<td>☐9</td>
<td>☐9</td>
</tr>
<tr>
<td>To be liked</td>
<td>☐10</td>
<td>☐10</td>
<td>☐10</td>
</tr>
<tr>
<td>So I won’t be teased</td>
<td>☐11</td>
<td>☐11</td>
<td>☐11</td>
</tr>
<tr>
<td>To expand my awareness</td>
<td>☐12</td>
<td>☐12</td>
<td>☐12</td>
</tr>
<tr>
<td>Increase my creativity</td>
<td>☐13</td>
<td>☐13</td>
<td>☐13</td>
</tr>
<tr>
<td>Understand things differently</td>
<td>☐14</td>
<td>☐14</td>
<td>☐14</td>
</tr>
<tr>
<td>Know myself better</td>
<td>☐15</td>
<td>☐15</td>
<td>☐15</td>
</tr>
<tr>
<td>It improves parties</td>
<td>☐16</td>
<td>☐16</td>
<td>☐16</td>
</tr>
<tr>
<td>Make social gatherings more fun</td>
<td>☐17</td>
<td>☐17</td>
<td>☐17</td>
</tr>
<tr>
<td>To be sociable</td>
<td>☐18</td>
<td>☐18</td>
<td>☐18</td>
</tr>
<tr>
<td>Helps me enjoy a party</td>
<td>☐19</td>
<td>☐19</td>
<td>☐19</td>
</tr>
<tr>
<td>Just because of habit</td>
<td>☐20</td>
<td>☐20</td>
<td>☐20</td>
</tr>
<tr>
<td>To help me sleep</td>
<td>☐21</td>
<td>☐21</td>
<td>☐21</td>
</tr>
<tr>
<td>To relax</td>
<td>☐22</td>
<td>☐22</td>
<td>☐22</td>
</tr>
<tr>
<td>To experiment</td>
<td>☐23</td>
<td>☐23</td>
<td>☐23</td>
</tr>
<tr>
<td>Other</td>
<td>☐24</td>
<td>☐24</td>
<td>☐24</td>
</tr>
</tbody>
</table>

(a)_______________________________________
(b)_______________________________________
(c)_______________________________________
13  a) Which of these statements best describes your feelings about your cannabis use over the next 12 months.

   I am not thinking of cutting down or stopping my cannabis use [1]
   I would like to change my cannabis use but I’m not sure if I’m ready [2]
   I am preparing myself to change my cannabis use [3]
   I am in the process of cutting down my cannabis use now [4]
   I am in the process of stopping my cannabis use now [5]
   I have quit my cannabis use [6]

b) Please rate how confident you are in avoiding cannabis use without further professional help from 0 to 10, where ‘0’ is “Not at all”, ‘5’ is “Somewhat” and ‘10’ is “Extremely confident”?

   _____ / 10

14  a) Have you tried to reduce your cannabis use WITHOUT professional help within the last twelve months?

   Yes [1]  
   No [0]

   b) If yes: What have you tried in your most recent attempts? (NCHSR)

      (Other) ________________________  Cutting down/controlled use [1]
                  ________________________  Stopped using [2]
                  ________________________  Self medication (legal) [3]
                  ________________________  Self medication (illicit) [4]
                  ________________________  Geographical/health trip [5]
                  ________________________  Isolation [6]
                  ________________________  Other [7]

   c) If yes: How many times (in 12 mos.)?  No. times __________

15  Have you ever discussed concerns about your cannabis use with a health worker or other professional? (record yes/no below) [at follow-up this question should be phrased “have you discussed any concerns…since we last spoke?”]

<table>
<thead>
<tr>
<th>Profession</th>
<th>Consulted? Y / N</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP/doctor</td>
<td></td>
</tr>
<tr>
<td>Community Health Centre</td>
<td></td>
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<tr>
<td>Hospital</td>
<td></td>
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<tr>
<td>Social worker</td>
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<tr>
<td>Mental health service</td>
<td></td>
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<tr>
<td>Drug treatment service</td>
<td></td>
</tr>
<tr>
<td>Counsellor / Psychologist</td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>
Q17. CANNABIS PROBLEMS QUESTIONNAIRE
These questions are about experiences that you may have had in connection with your use of cannabis (marijuana, pot, dope, etc), especially in the LAST 3 MONTHS.

<table>
<thead>
<tr>
<th>IN THE LAST 3 MONTHS</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.1 Have you tended to smoke more on your own than you used to?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.2 Have you worried about meeting people you don't know when you are stoned?</td>
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<tr>
<td>17.3 Have you spent more time with smoking friends than other kinds of friends?</td>
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<tr>
<td>17.4 Have your friends criticised you for smoking too much?</td>
<td></td>
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<tr>
<td>17.5 Have you sold any of your belongings to buy cannabis?</td>
<td></td>
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<tr>
<td>17.6 Do you find yourself making excuses about money?</td>
<td></td>
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<tr>
<td>17.7 Have you been in trouble with the police due to your smoking?</td>
<td></td>
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<tr>
<td>17.8 Have you been physically sick after smoking?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.9 Have you passed out after a smoking session?</td>
<td></td>
<td></td>
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<tr>
<td>17.10 Have you had pains in your chest or lungs after a smoking session?</td>
<td></td>
<td></td>
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<tr>
<td>17.11 Have you felt paranoid after a smoking session?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.12 Have you been neglecting yourself physically?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.13 Have you failed to wash for several days at a time?</td>
<td></td>
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<tr>
<td>17.14 Have you felt depressed for more than a week?</td>
<td></td>
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<tr>
<td>17.15 Have you felt so depressed that you felt like doing away with yourself?</td>
<td></td>
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</tr>
<tr>
<td>17.16 Have you given up any recreational activities you once enjoyed for smoking?</td>
<td></td>
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<tr>
<td>17.17 Do you find it hard to get the same enjoyment from your usual interests?</td>
<td></td>
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<tr>
<td>17.18 Has your general health been poorer than usual?</td>
<td></td>
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</tr>
<tr>
<td>17.19 Have you felt more antisocial after smoking?</td>
<td></td>
<td></td>
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<tr>
<td>17.20 Have you been concerned about a lack of motivation?</td>
<td></td>
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</tr>
<tr>
<td>17.21 Have you worried about feelings of personal isolation or detachment?</td>
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<tr>
<td>17.22 Do you usually have a smoke in the morning, to get yourself going?</td>
<td></td>
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</tbody>
</table>
Please indicate which statements best describe your own health state today:

a) Mobility
I have no problems walking around  □ 1
I have some problems in walking around  □ 2
I am confined to bed  □ 3

b) Personal Care
I have no problems with personal care  □ 1
I have some problems washing or dressing myself  □ 2
I am unable to wash or dress myself  □ 3

c) Usual Activities (work, study, housework, family or leisure activities)
I have no problems with performing my usual activities  □ 1
I have some problems with performing my usual activities  □ 2
I am unable to perform my usual activities  □ 3

d) Pain/Discomfort
I have no pain or discomfort  □ 1
I have moderate pain or discomfort  □ 2
I have extreme pain or discomfort  □ 3

e) Anxiety/Depression
I am not anxious or depressed  □ 1
I am moderately anxious or depressed  □ 2
I am extremely anxious or depressed  □ 3
19  EQ5D- Physical health scale

To help people say how good or bad a health state is, we have a scale on which the best state you can imagine being is marked 100 and the worst state you can imagine is marked 0.

We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do so by selecting any number from 0 to 100.

___  ___  ___

20  The Kessler-10

The next questions are about how you have been feeling during the past 30 days. During the past 30 days about how often did you feel…..

<table>
<thead>
<tr>
<th>During the past 30 days, about how often did you feel…….</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.1 Tired out for no good reason?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.2 Nervous?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.3 So nervous that nothing could calm you down?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.4 Hopeless?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.5 Restless or fidgety?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.6 So restless that you could not sit still?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.7 Depressed?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.8 That everything was an effort?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.9 So sad that nothing could cheer you up?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.10 Worthless?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
These next questions are to do with the social support that you have available to you

21 Who do you live with at the moment? (BTOM)

- Alone □ 1
- Spouse/partner □ 2
- Alone with child(ren) □ 3
- Spouse/partner and child(ren) □ 4
- Parent(s) □ 5
- Other relative(s) □ 6
- Friend(s) □ 7
- Friend(s)/parent(s)/relative(s) and children □ 8
- Other (specify) __________________________ □ 9
- Not stated/not known/inadequately described □ 0

22 The Social Support Questionnaire (6-item)

For the next six questions I require you to think about how many friends you feel you could rely on when facing different situations in life. Once this is done you will be asked to rate your satisfaction with the help you received on a 6 point Likert scale from “Very dissatisfied” to “Very satisfied”

A). Whom can you really count on to be dependable when you need help?
#__________________________ Very dissatisfied □ 0 □ 1 □ 2 □ 3 □ 4 □ 5 Very satisfied

B). Whom can you really count on to help you feel more relaxed when you are under pressure or tense?
#__________________________ Very dissatisfied □ 0 □ 1 □ 2 □ 3 □ 4 □ 5 Very satisfied

C). Who accepts you totally, including both your worst and your best points?
#__________________________ Very dissatisfied □ 0 □ 1 □ 2 □ 3 □ 4 □ 5 Very satisfied

D). Whom can you really count on to care about you, regardless of what is happening to you?
#__________________________ Very dissatisfied □ 0 □ 1 □ 2 □ 3 □ 4 □ 5 Very satisfied

E). Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?
#__________________________ Very dissatisfied □ 0 □ 1 □ 2 □ 3 □ 4 □ 5 Very satisfied
F). Whom can you count on to console you when you are very upset?

Very dissatisfied ☐0 ☐1 ☐2 ☐3 ☐4 ☐5 Very satisfied

23 What percentage of your friends would you estimate smoke cannabis?

___________%

24. Treatment Credibility Scale (Credibility/Expectancy Questionnaire)

I’m just going to explain to you a bit about the treatment so you can answer the final three questions. This treatment is based on cognitive-behavioural therapy. Cognitive-behavioural therapy delivered one-on-one in a counselling session or in a group has been found to be the most effective treatment for decreasing substance use. In essence, cognitive-behavioural therapy teaches people how to reduce their cannabis use by changing the way they think and the way they act. Some of the strategies that you will learn in this program include: how to avoid cannabis; how to change your thinking by examining the evidence for and against your beliefs, and how to make change plans to reduce your cannabis use. The treatment consists of four modules, each of which will be delivered via the telephone, with one call each week for four weeks. Each module is complemented with a self-help workbook to assist in your cannabis reduction.

A) Please rate how logical this type of treatment seems to you from 0 to 10 where ‘0’ is “Not at all logical” and ‘10’ is “Very logical”?

_______ / 10

B) Please rate how successful you think this treatment will be in reducing your cannabis use and related problems from 0 to 10, where ‘1’ is “Not at all successful” and ‘10’ is “Very successful”

_______ / 10

C) Please rate how confident you would be in recommending this treatment to a friend who experiences problems with cannabis, from 1 to 10 where ‘1’ is “Not at all confident” and ‘10’ is “Very confident”

_______ / 10
Please rate how much you agree or disagree to the following statements from 1 – 7, where ‘1’ is “Strongly Disagree”, ‘4’ is “neutral” and ‘7’ is “Strongly Agree”

1. My counsellor and I agreed about the steps taken to help improve my situation

2. I agree that the activities in counselling were useful

3. I shared a mutual liking with my counsellor

4. I had doubts or a lack of understanding about what I was trying to accomplish in counselling

5. I felt confident in the counsellor’s ability to help me

6. I shared mutually agreed upon goals with my counsellor

7. I felt that the counsellor appreciated me as a person

8. My counsellor and I agreed on what was important for me to work on

9. I shared a mutual trust between myself and my counsellor

10. My counsellor and I had different ideas about what my real problems were

11. I have established a good understanding of the changes that are good for me

12. I believe that the way my counsellor and I are worked with my problem was correct
APPENDIX E:

PUBLICATIONS AND PRESENTATIONS

ARISING FROM THE PRESENT THESIS
**PEER REVIEWED PUBLICATIONS**


**PRESENTATIONS**


**PANEL DISCUSSIONS**

Barriers and facilitators to cannabis treatment

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Abstract

Introduction and Aims. Despite its continued widespread use, relatively few individuals with cannabis use disorders present to treatment services. There is a dearth of research examining the reasons for this observed underutilisation of treatment. The aim of this paper is to examine barriers and facilitators to entry into cannabis treatment. Design and Methods. Three surveys of regular cannabis users in treatment (N = 100), in the community (N = 100) and from a statewide Internet sample (N = 294). Results. Perceived barriers included: not being aware of treatment options; thinking treatment is unnecessary; not wanting to stop using cannabis; and wanting to avoid the stigma associated with accessing treatment. Perceived facilitators included: improving available information on treatment; keeping treatment specific to cannabis; offering additional services, such as telephone support; and simplifying treatment admission processes. Discussion and Conclusions. Participants’ perceptions differed significantly depending on their age, gender and treatment status. Participants in treatment typically reported barriers intrinsic to the individual while participants from the community reported barriers relating to the treatment available. Reported facilitators were more homogeneous and most commonly related to availability of information. [Gates P, Copeland J, Swift W, Martin G. Barriers and facilitators to cannabis treatment. Drug Alcohol Rev 2012;31:311–319]

Keywords: cannabis, treatment, barrier, facilitator, marijuana.

Introduction

In comparison with other illicit drugs, cannabis use in Australia remains high [1]. In the 2007 National Drug Strategy Household Survey, 9.1% of Australians aged 14 years or older indicated using cannabis in the past year, of which an estimated 14.9% reported using cannabis on a daily basis [1]. Similarly, in the 2007 National Survey on Drug Use and Health, 10.1% of Americans aged 12 years or older indicated using cannabis in the past year, of which an estimated 14.2% reported using cannabis daily or near daily [2]. This is concerning given that greater frequency of use is associated with increased risk of physical and mental health problems, and the development of dependence [3-4]. The 1997 Australian National Survey of Mental Health and Wellbeing found that, among those who had used cannabis at least five times in the previous year, 21% met DSM-IV criteria for cannabis dependence [5].

While effective treatments for cannabis use disorders have been developed, longitudinal research has shown that only approximately one in three out of 10 dependent cannabis users will seek treatment within a given year [6-8]. The proportion of individuals entering treatment for cannabis use is significantly less than the proportion that would benefit by doing so [9]. Attempts to explain the disproportionate low rate of treatment uptake consider the characteristics of individuals seeking and attending treatment, treatment effectiveness, attitudes toward treatment, structural barriers to accessing treatment such as cost and transport, and also factors that militate against facilitators to treatment.

Identifying relevant differences between individuals with cannabis use disorder who seek treatment, and those who do not, may help explain the low numbers entering treatment. A large study in Denmark showed a high prevalence of previous psychiatric admissions
Caller satisfaction with the Cannabis Information and Helpline

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Summary
We assessed caller satisfaction with an illicit drug helpline in Australia (the Cannabis Information and Helpline, CIH). A 10-min telephone interview was conducted with 200 volunteers who called the service during 2009 (121 calling regarding themselves and 79 calling regarding another person’s cannabis use). Callers were a mean of 43 years of age and typically female (59%). Callers showed high levels of satisfaction with the service; the mean CSEQ-8 score was 28.2 (SD = 4.3).

Participants who found the service easy to access and those who felt their needs were met reported the highest satisfaction. A linear regression analysis was conducted to identify the significant predictors of participants’ satisfaction with the CIH. The ease with which the participant was able to get through to a counsellor (standardized beta = 2.37, \( P < 0.02 \)) and whether the participant felt that all their needs were met (standardized beta = −4.26, \( P < 0.001 \)) were the only significant predictors of total satisfaction with the call. Despite the recognition that telephone services are possibly the easiest health-care service to access, ensuring consistent availability and accessibility remains paramount although not easy.

Introduction

Cannabis is the Western world’s most frequently used illicit drug, despite links with a range of adverse health effects. Although the rate of drug users entering treatment has increased over the last decade in the USA and Australia, most people who use cannabis do not seek treatment, despite the published success and availability of several treatments. Telephone helplines have improved access to treatment for people experiencing mental health crises. There have also evolved into a promising means of providing assistance for people with tobacco dependence and general substance use concerns.

Providing information about treatment options and access to treatments is particularly important in facilitating cannabis treatment seeking. In response to a recognized dearth of national drug and alcohol helplines in Australia, the National Cannabis Strategy recommended that a helpline specific to cannabis-related concerns should be provided. In 2008, Australia’s first free national Cannabis Information and Helpline (CIH) was established.

However, providing access to information and education on treatment options alone may not suffice. People may need to be satisfied with the service before they will access it and continue with treatment. The measurement of satisfaction is important when evaluating the quality of medical healthcare services and, more recently, substance abuse treatment. Despite the value of assessing client satisfaction, evaluations of telephone counselling services have been based mostly on their face validity and numbers of callers.

Given the resources involved in providing telephone counselling services, there is a need to assess the content and level of clients’ satisfaction with the services provided.

Satisfaction with drug helplines has rarely been researched due to methodological difficulties such as the desire to maintain anonymity of people who use telephone helplines, and a lack of resources. A single study has been published on the helpfulness of American illicit drug helplines. However, this study referred to the opinion of psychologists making scripted calls and not to genuine caller satisfaction. The present study aimed to assess satisfaction with an illicit drug helpline by analysing callers’ satisfaction.

Methods

Data were collected via telephone interviews, from 200 participants who satisfied the study eligibility criteria of...
Telephone-based cannabis intervention trial

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Running head: TELEPHONE-BASED CANNABIS INTERVENTION TRIAL

Randomised Controlled Trial of a Novel Cannabis Use Intervention Delivered by Telephone

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Conflict of Interest Declaration

The authors declare that they have no financial or commercial interest in the tobacco, alcohol, gaming, or pharmaceutical industries, or any body funded by one of these organisations.

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