

Post-Traumatic Stress Disorder, Depression and Anxiety among North Korean Refugees: A Meta-Analysis

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Objective Post-traumatic stress disorder is common among North Korean refugees who have fled their country for economic, financial and humanitarian reasons. Co-morbid depression and anxiety are also common among North Korean refugees, due to the difficulties they have faced within their country and during their escape journey. Depression and anxiety complicate treatment for post-traumatic stress disorder, and lead to poorer outcomes. Thus, the aim of the present study was to provide a meta-analysis of studies investigating post-traumatic stress disorder, depression, and anxiety among North Korean refugees.

Methods Selected articles were published in English, and included measures of post-traumatic stress, and/or depression and anxiety. 10 studies were included in the depression meta-analysis, and 6 in the anxiety meta-analysis.

Results A random-effects model revealed strong, significant associations between post-traumatic stress and depression, $r=0.63$, 95% CI (0.51, 0.72), $p<0.001$, $z=8.33$, and anxiety, $r=0.51$, 95% CI (0.36, 0.63), $p<0.001$, $z=6.07$. The relationships between post-traumatic stress, depression and anxiety were higher among adults and those with more than five years outside of North Korea.

Conclusion Depression appears to be an important treatment focus for North Korean refugees with post-traumatic stress.

Psychiatry Investig 2017;14(5):550-561

Key Words North Korean refugees, Post-traumatic stress disorder, Anxiety, Depression.

INTRODUCTION

North Korea is an independent state governed by a dictatorial regime. Each year, thousands of North Koreans seek to escape their country due to excessively harsh living conditions, fears of imprisonment and political persecution, and the potential of death by starvation.¹⁻³ As a result of the experiences they endure, many North Korean refugees who have escaped from their country develop symptoms of post-traumatic stress disorder (PTSD); a condition involving flashbacks, dissociative reactions, cognitive and perceptual disturbances, and nightmares.⁴ PTSD is a serious mental health condition, and is associated with significant emotional disturbance,⁵ and poor employment outcomes.⁶ Further, PTSD has been shown to have a co-morbid relationship with both

depression and anxiety, with some studies emphasizing the importance of depression,^{7,8} and yet others, anxiety.⁹ In order to fully appreciate the mental health concerns of North Korean refugees, and how these individuals come to develop mental health concerns such as PTSD, depression and anxiety, we must first understand daily life in North Korea, and the processes involved in escaping from the country.

North Korea is led by Kim Jong Un; the third leader in the Kim dynasty, following from previous communist leaders Kim Jong Il and Kim Il Sung. The Kim regime promotes the Juche ideology; a political philosophy emphasizing self-reliance, military advancement, and strict isolation from the outside world.² North Korean citizens are strictly forbidden from contact with the outside world and use of the Internet. Citizens are punished severely if they are caught with foreign media such as DVD's, music, and literature.^{2,10} Citizens are organized into *inminban*; collective living groups, the role of which is to function as a cohesive, co-operative unit that reports any disloyalty to a designated group head.³ Any accusations of disloyalty or failure to report disloyalty can result in harsh punishments, such as confinement in prison camps, torture, and relocation.^{3,10} As a result, fear of being seen as disloyal to the regime is a constant source of stress among North Koreans.

Received: June 24, 2016 Revised: August 26, 2016

Accepted: October 11, 2016 Available online: July 7, 2017

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Political propaganda is a common feature of daily life for North Koreans. Citizens work six days a week, begin work at 8:00 am, and finish their daily duties at 5:00 pm.¹⁰ After completing their daily duties, workers gather for education sessions, where they recite and discuss key policies of the Korean Workers Party (KWP), and are required to discuss weaknesses of their fellow workers.¹⁰ Indeed, party propaganda is introduced to citizens at a young age, when they are taught stories such as the ability of the supreme leader to control the weather, and fly. North Koreans are also indoctrinated into an anti-American, anti-Westerner world view, and are taught various falsities regarding life in America and South Korea.³

Food shortages are an additional source of stress for North Koreans. Following an economic breakdown in the 1990s, poverty has become rampant across the country.¹¹ Collectivization campaigns have increased; resulting in the forced starvation and as a result, death of thousands of citizens living outside the capital of Pyongyang.^{3,11} Food shortages exist to the current day, and the regimes' failure to open themselves to foreign aid has been criticized by the United Nations Human Rights Commission.¹ Thus, daily life in North Korea is characterized by a pervasive sense of distrust of others, constant pressure to conform to party propaganda, and uncertainty regarding access to basic resources.

Due to the reasons outlined above, many North Koreans attempt to escape the country, in order to seek asylum in South Korea and China. However, the process of escaping from North Korea may be equally, if not more, traumatic than living within the country itself. North Koreans are strictly forbidden to leave the country under any circumstances, and to do so is considered a treasonable action that is punishable by imprisonment and death.¹ Further, refugees face the risk of being shot and killed while they cross the border. Refugees may also die from starvation and severe cold. Many refugees who manage to escape into China face the constant risk of repatriation by the Chinese police, or capture by human traffickers. Eye-witness testimonies have revealed an intricate network of sex- trafficking of North Korean women; that begins at the border and ends in countries as diverse as Taiwan and Vietnam.^{3,10}

North Koreans who successfully arrive in South Korea and surrounding countries may present with a long history of trauma, including but not limited to imprisonment and torture, chronic malnutrition, witnessing public executions, political brainwashing, evading capture in China, rape/sexual abuse, and being close to death.¹²⁻¹⁵ As a result of these experiences, many North Korean refugees develop mental health disorders including PTSD. The relative association of PTSD with conditions such as depression and anxiety across populations is an important factor to consider in the treatment of

PTSD. The relationship between PTSD and depression has been consistently established among individuals with exposure to long-term traumas of more than several years.¹⁶⁻¹⁹

Further, with regards to age of traumatization, females who experience trauma under the age of 13 are more likely to develop major depressive disorder, while those who experience trauma past this age are more likely to develop PTSD.²⁰ This co-morbidity may be due in part to the overlap in symptoms such as anhedonia and emotional numbing that are observed in both PTSD and depression.¹⁷ Evidence also suggests that PTSD is associated with anxiety disorders among individuals who are long-term survivors of childhood trauma.²¹ Specifically, a common feature of this co-morbidity may be a reduced ability to regulate anxious arousal.²¹ More recent evidence suggests that the affective features of PTSD are most predictive of the co-morbid development of major depressive disorder, as well as generalized anxiety disorder.¹⁸ Specifically, dysphoria, rather than dysphoric-arousal has been identified as a latent structure that can best account for the co-morbidity between PTSD, state and trait anxiety, and depressive rumination.¹⁹

Psychiatric co-morbidity complicates treatment, and in the context of PTSD, leads to poorer treatment outcomes and higher relapse rates.^{22,23} Therefore, it is essential to understand the relative association of PTSD with depression and anxiety across various populations, as this will guide the choice of transdiagnostic treatment. In the context of mental health among North Korean refugees, studies to date have revealed associations of PTSD with both depression and anxiety,^{15,24} however, the relative strength of these associations across studies is currently unknown. Further, it is unknown whether these associations differ across demographic features such as age and time outside North Korea.

The aim of the present study is to provide a meta-analysis of studies investigating 1) the relationship between PTSD and depression among North Korean refugees and 2) the relationship between PTSD and anxiety among North Korean refugees. This may provide important insights into patterns of psychological functioning among North Korean refugees, which can be used to direct treatments for this group. Specifically, the findings of the current study may be used to guide the choice of transdiagnostic treatment for North Korean refugees, with a focus on particular psychological mechanisms that cut across diagnostic categories. To our knowledge, this is the first meta-analytic study conducted in the English language that collectively reports on these associations. We developed the following hypotheses: 1) a positive relationship will be found between PTSD and depression among North Korean refugees, 2) a positive relationship will be found between PTSD and anxiety among North Korean refugees, and 3) the relationship be-

tween PTSD and depression will be stronger than the relationship between PTSD and anxiety.

METHODS

Study selection

A literature review was carried out in May 2016, using the databases Scopus and Google Scholar. The search was aimed at identifying all relevant studies in the English language. Key search terms included: “North Korea,” “depression” AND/OR “anxiety,” and “post-traumatic stress disorder” and “mental health.” Thirty-six results were obtained from this search; of which 27 articles were relevant. Reference lists of the 27 articles retrieved were searched, but no additional papers in the English language were identified. Further, two papers were identified in the Korean language but the reliability and validity of the measures included were not reported. The inclusion criteria for the subsequent meta-analysis stipulated that: the article must be English, have participants who are North Korean refugees living outside of North Korea, include a measure of PTSD, include a measure of depression and/or anxiety, and have quantitative data suitable for a meta analysis.

The 27 articles were assessed in line with these criteria (Figure 1). This left 10 articles for the meta-analysis on PTSD/depression, and 6 articles for the meta-analysis on PTSD/anxiety. The articles for both meta-analyses were the same. That is, 6 of the articles on PTSD/depression also reported associ-

ations between PTSD and anxiety, meaning that the total number of articles included in the meta-analyses was 10.

Study characteristics

The modal measure for PTSD in the 16 studies was the Impact of Events Scale-Revised (IES-R; $n=4$),²⁵ followed by the Post-Traumatic Stress Disorder Symptoms Scale (PTSD-SS; $n=2$),²⁶ Post-Traumatic Diagnostic Scale (PDS; $n=2$),²⁷ and several others. The modal measures for depression in the 10 relevant studies were the Centre for Epidemiological Studies Depression Scale (CES-D; $n=3$)²⁸ and Hopkins Symptoms Checklist 25 or 37 (HSCL-25/37; $n=3$),²⁹ followed by several others. The modal measure for anxiety was also the HSCL-25/37 ($n=2$),²⁹ followed by various others. The modal country of settlement among participants was South Korea ($n=9$), followed by China ($n=2$). The remaining studies did not report the settlement country of participants ($n=5$). This information is presented in more detail in Table 1 and 2.

Statistical analysis

All analyses were conducted using Comprehensive Meta-Analysis (CMA) version 3. The Pearson's correlation r was chosen as the effect size (ES) statistic. This choice was made because it was one of the most commonly reported statistics within the literature and is also commonly used within meta-analyses.³⁰ The ES represented the size of the relationship between PTSD and either depression or anxiety among refu-

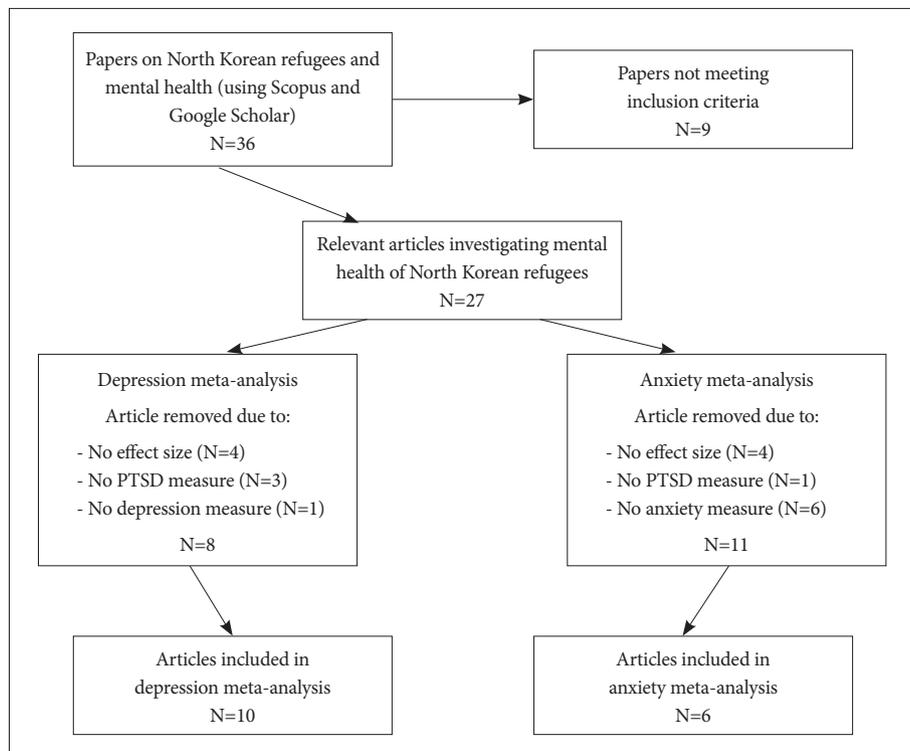


Figure 1. Selection process for studies reporting associations between post-traumatic stress disorder, depression, and anxiety among North Korean refugees. PTSD: post-traumatic stress disorder.

Table 1. Studies reporting an association between symptoms of depression and post-traumatic stress disorder among North Korean refugees

Study	Measures	Population	Effect size	p-value	SE	Weight
Jeon et al. ⁴²	Beck Depression Inventory (BDI), Post-Traumatic Stress Disorder Symptom Scale (PTSDS-SS)	106 North Korean defectors living in South Korea for 7 years	r=-0.433	p<0.001	1.0	1
Jun et al. ⁴⁴	Centre for Epidemiological Studies Depression Scale (CES-D), Impact of Event Scale-Revised (IES-R)	201 North Korean refugees living in South Korea	r=0.63	p<0.001	1.0	1
Kim ¹⁵	Hopkins Symptoms Checklist (HSCL-37) Depression Subscale, Post-traumatic Diagnostic Scale (PDS)	144 North Korean refugee youth	Complex Trauma, r=0.66, Simple Trauma, r=0.66, Interpersonal Trauma, r=0.34 Accident-related Trauma, r=0.26, M=0.48	p<0.01 (all)	1.0	1
Kim et al. ³⁵	Hopkins Symptoms Checklist (HSCL-25) Depression Subscale, UCLA Post-Traumatic Stress Disorder Index for DSM-IV Adolescent Version	144 North Korean refugee adolescents	Accident-related Trauma, r=0.34, Interpersonal Trauma, r=0.28, M=0.31	Interpersonal Trauma, p<0.01 Accident-related Trauma, p<0.000	1.0	1
Lee et al. ³¹	Centre for Epidemiological Studies Depression Scale (CES- D), Impact of Event Scale-Revised (IES-R)	177 North Korean refugees living in South Korea Depressed NK with PTSD=55 Depressed NK without PTSD=26, N=81	Subjects with PTSD and depression most likely to have insomnia, $\chi^2=45.90$, r between depression, PTSD and insomnia: r=0.753	p<0.001	1.0	1
Park et al. ¹⁴	Centre for Epidemiological Studies Depression Scale (CES- D), Impact of Event Scale-Revised (IES-R)	199 North Korean refugees living in South Korea	r=0.61	p<0.001	1.0	1
Shin et al. ²⁴	Patient Health Questionnaire-9 (PHQ-9) Depression Scale, Post-Traumatic Embitment Disorder Scale (PTED)	194 North Korean refugees	r=0.781	p<0.01	1.0	1
Song et al. ¹³	Minnesota-Multiphasic Personality Inventory-PTSD (MMPI-PTSD), Beck Depression Inventory (BDI)	32 North Korean defectors	r=0.853	p<0.001	0.99	1.02
Yu and Jeon ³²	Personality Assessment Inventory (PAI) with Depression/PTSD Subscales	65 North Korean defectors	Full vs. non: t=-1.855 Partial vs. non: -1.098 Full+without, r=0.49 Partial+without, r=0.23 Mean=0.36	Full vs. non: p=0068 Partial vs. non: p=0.276	1.0	1
Lee et al. ¹²	Hopkins Symptom Checklist-25 (HSCL-25) and Harvard Trauma Questionnaire (HTQ)	170 North Korean 'food' refugees living in China	r=0.76	p<0.005	1.0	1

Table 2. Studies reporting an association between symptoms of anxiety and post-traumatic stress disorder among North Korean refugees

Study	Measures	Population	Effect size	p-value	SE	Weight
Lee et al. ¹²	Hopkins Symptom Checklist -25 (HSCL-25) and Harvard Trauma Questionnaire (HTQ)	170 North Korean 'food' refugees living in China	r=0.72	p<0.005	1.0	1
Jeon et al. ⁴²	Post-Traumatic Stress Disorder Symptom Scale (PTSDS-SS), Hopkins Symptom Checklist (HSCL), 10-Item Anxiety Subscale	106 North Korean refugees	r=0.44	p<0.001	1.0	1
Jun et al. ⁴⁴	State-Trait Anxiety Inventory (STAI), Impact of Events Scale-Revised (IES-R)	201 North Korean refugees living in South Korea	r=0.49	p<0.001	1.0	1
Kim ¹⁵	Post-traumatic Diagnostic Scale (PDS), Hopkins Symptom Checklist-37 (HSCL-37) Anxiety Subscale	144 North Korean refugee youth	Complex Trauma, r=0.66, Simple Trauma, r=0.66, Interpersonal Trauma, r=0.30, Accident-related Trauma, r=0.23, M=0.46	p<0.01 for all	1.0	1
Kim et al. ³⁵	Hopkins Symptoms Checklist (HSCL-25) Anxiety Subscale, UCLA Post-Traumatic Stress Disorder Index for DSM-IV Adolescent Version	144 North Korean refugee youth	Accident-related Trauma, r=0.29, Interpersonal Trauma, r=0.24, M=0.27	p<0.01	1.0	1
Yu and Jeon ³²	Personality Assessment Inventory (PAI) with Depression/PTSD Subscales	65 North Korean defectors	Full vs. non: t=-2.64, Partial vs. non: t=-2.62, Full+without, r=0.62, Partial+without, r=0.50, Mean: r=0.56	Full vs. non: p=0.01, Partial vs. non: p=0.01	1.0	1

gees from North Korea. In accordance with the Cohen's (1988) classification system of correlations, the following criteria have employed to describe the results: rs 0.10 are considered small, rs 0.30 are considered moderate and rs of 0.50 and above are considered to be large.

Several studies reported effects other than Pearson's correlation coefficient. Lee et al.³¹ reported chi-square statistics demonstrating that North Koreans with PTSD and insomnia were more likely to have depression. Further, Yu and Jeon³² compared depressive symptoms between North Koreans with full PTSD and those without, as well as North Koreans with partial PTSD and those without. In both cases, the reported effects were converted to Pearson's correlation coefficients through an online meta-analysis calculator,³³ and each effect was included in the meta-analysis. Furthermore no studies reported standard errors for correlation coefficients, so these were calculated with the following formula:

$$se(r) = \sqrt{1-r^2/n-2}$$

(se=standard error, n=sample size, r=correlation coefficient)

Two studies utilized multiple PTSD measures and therefore multiple ES are available for each study. In order to include all of the available information, but also to ensure that no single study made a disproportional contribution to the ES calculations, CMA was instructed to average the multiple within study correlations to correct for violations of independence.

Due to the variety of demographic features in the included studies, homogeneity of the samples was unlikely and a random effects model was employed. Utilizing a random effects model was in keeping with recommendations by Rosenthal³⁴ who argues that a random effects model is the more conservative approach to use when faced with heterogeneity of the included samples.

Furthermore subgroup analyses were conducted to assess whether the relationships between PTSD and depression, and PTSD and anxiety differed as a function of age and time spent outside of North Korea. This was undertaken due to the fact that these were the most common demographics reported across studies. Further, across studies, there appeared to be a pattern of increasing psychological burden with age and time outside North Korea.

RESULTS

Descriptive statistics

Descriptive statistics were obtained for the studies investigating PTSD and depression, and PTSD and anxiety. Effects regarding the association between PTSD and depression ranged from 0.31 to 0.85 (M=0.60, SD=0.19), while effects regarding the association between PTSD and anxiety ranged

from 0.27 to 0.72 (M=0.49, SD=0.15).

Pooled estimates and homogeneity

A fixed-effects model revealed significant violations of homogeneity among studies reporting an association between PTSD and depression, and PTSD and anxiety. In contrast, a random-effects model yielded a non-significant Q statistic for studies investigating PTSD and depression, Q(9)=87.23, p<0.001 and PTSD and anxiety, Q(5)=33.26, p<0.001. Therefore, this model was adopted to fit the data (Figures 2 and 3).

Publication bias

Publication bias was assessed through Rosenthal's failsafe n and a series of funnel plots (Figures 4 and 5). Rosenthal's failsafe n provides an estimate of the number of missing

studies that would be needed in order to achieve non-significant findings.³⁴ This takes into account the 'file draw' problem regarding potential existing studies with non-significant findings that have not been published. The failsafe n for studies reporting an association between PTSD and depression was 1711, z=25.71, p<0.001, while for studies reporting an association between PTSD and anxiety, the failsafe n was 383, z=15.77, p<0.001. Visual inspection of the funnel plots for studies reporting an association between PTSD and depression, and PTSD and anxiety suggest that the results for both analyses were unbiased. This was evident through a symmetrical fanning of points throughout the graphs.³⁰

PTSD and depression

The ES across the 10 studies pertaining to PTSD and de-

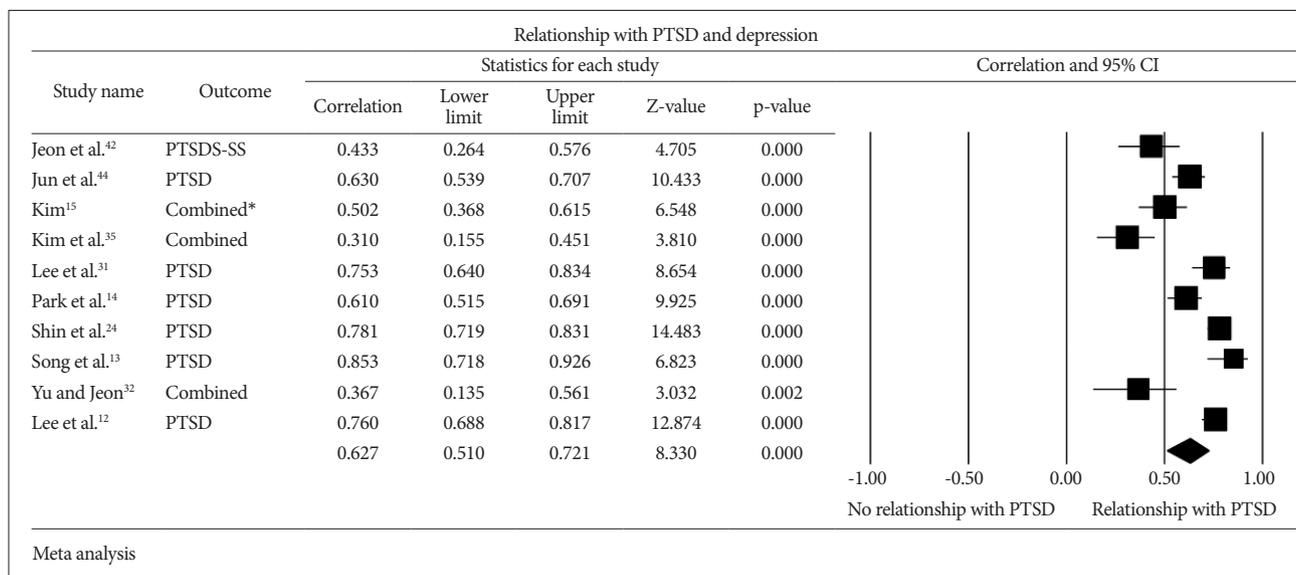


Figure 2. Random effects model of studies investigating PTSD and depression among North Korean defectors. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

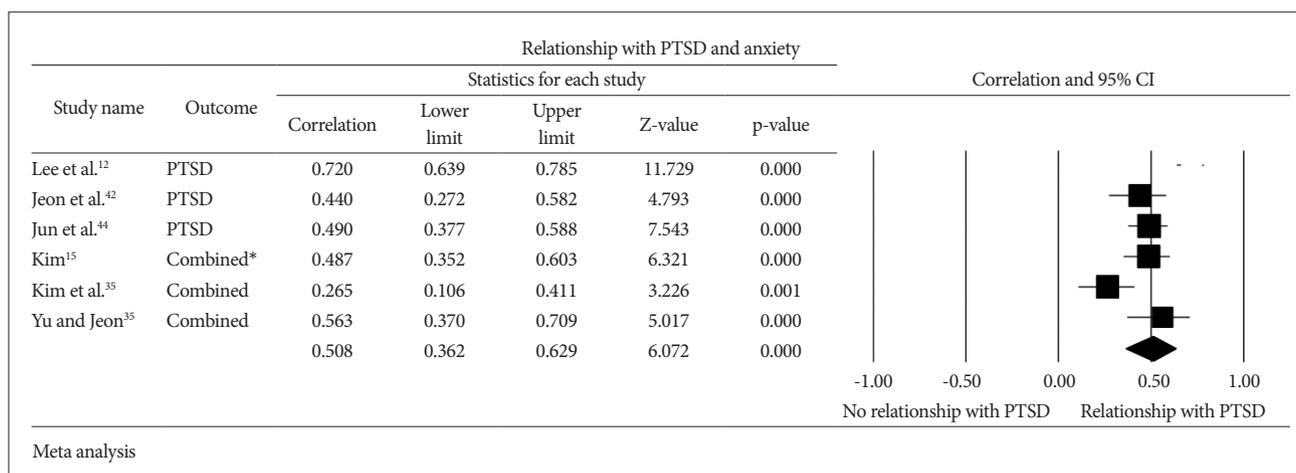


Figure 3. Random effects model of studies investigating PTSD and anxiety among North Korean defectors. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

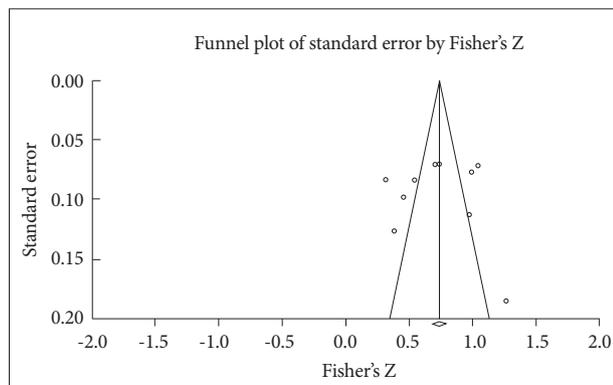


Figure 4. Funnel plot: PTSD and depression. PTSD: post-traumatic stress disorder.

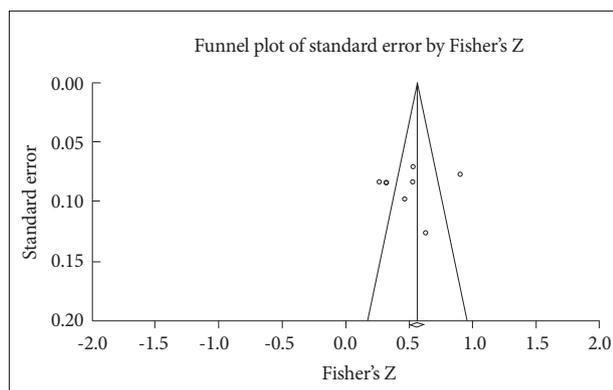


Figure 5. Funnel plot: PTSD and anxiety. PTSD: post-traumatic stress disorder.

pression was found to be a significant strong positive relationship, $r=0.63$, 95% CI (0.51, 0.72), $p<0.001$, $z=8.33$. This indicates that PTSD has a strong relationship with depression for North Korean refugees. Further analyses were undertaken to examine whether this relationship differed as a function of age and time spent outside of North Korea.

The relationship between PTSD and depression in studies involving adults was found to be a significant, strong positive relationship, $r=0.67$, 95% CI (0.57, 0.76), $z=9.24$, $p<0.001$ and was higher than the relationship between PTSD and depression in studies involving youths, $r=0.41$, 95% CI (0.21, 0.58), $z=3.78$, $p<0.001$ (Figures 6 and 7).

The relationship between PTSD and depression for North Koreans with less than five years outside of North Korea, $r=0.53$, 95% CI (0.29, 0.71), $z=3.91$, $p<0.001$ was weaker than the relationship between PTSD and depression for North Koreans with more than five years outside of North Korea, $r=0.65$, 95% CI (0.54, 0.74), $z=8.73$, $p<0.001$ (Figures 8 and 9).

PTSD and anxiety

The ES across the six studies pertaining to PTSD and anxiety was found to be a significant strong positive relationship,

$r=0.51$, 95% CI (0.36, 0.63), $p<0.001$, $z=6.07$. This indicates that PTSD is strongly associated with anxiety among North Korean refugees. Further analyses were undertaken to examine whether this relationship differed as a function of age and time spent outside of North Korea.

The relationship between PTSD and anxiety in studies involving adults, $r=0.49$, 95% CI (0.41, 0.56), $z=10.20$, $p<0.001$ was higher than the relationship between PTSD and anxiety in studies involving youths, $r=0.38$, 95% CI (0.15, 0.58), $z=3.08$, $p<0.001$ (Figures 10 and 11).

Finally, the relationship between PTSD and anxiety for North Korean refugees with less than 5 years outside North Korea, $r=0.44$, 95% CI (0.25, 0.59), $z=4.31$, $p<0.001$ was less than the relationship between PTSD and anxiety for North Korean refugees with more than five years outside of North Korea, $r=0.47$, 95% CI (0.38, 0.56), $z=8.92$, $p<0.001$ (Figures 12 and 13).

DISCUSSION

North Korea is an independent state that is eyed suspiciously by the West. Its government is totalitarian in nature, and political, humanitarian and economic factors lead to a steady number of its population wanting to flee. Refugees who have fled North Korea often experience symptoms of post-traumatic stress disorder (PTSD), depression, and anxiety. The aim of the present study was to provide a meta-analysis of studies investigating the relationship between PTSD and depression, and PTSD and anxiety among North Korean refugees. It was hypothesised that significant relationships between PTSD and depression, and PTSD and anxiety would be found across studies. It was also hypothesised that the relationship between PTSD and depression would be stronger than the relationship between PTSD and anxiety. The results of a random-effects meta-analysis supported these hypotheses. The effect involving PTSD and depression was 0.63, while the effect regarding PTSD and anxiety was 0.51.

The finding that PTSD was significantly associated with depression across studies parallels previous findings.^{7,8} Refugees who have escaped from North Korea often present with a history of horrific events that may evoke a sense of helplessness, such as chronic famine, witnessing executions, imprisonment and torture, and rape/sexual abuse.^{15,35} This helplessness may be compounded by the prospects of leaving family members behind in North Korea, difficulties in adjusting to life in South Korea, and establishing a new life while managing the burden of past experiences. Such experiences are often reported to be traumatic by these individuals, and are associated with the development of PTSD and depressive thinking. The finding that PTSD was significantly associated with anxiety across studies also reflects previous evidence.⁹

North Korean defectors have come from a country underpinned by a pervasive sense of mistrust, constant pressures to conform to communist propaganda, and uncertainty regarding access to basic resources and amenities.¹¹ For refugees

who have escaped through China, constant fears of being caught and repatriated may persist in life within South Korea, resulting in high levels of anxiety for these individuals.³ Further, trauma in relation to instances involving near cap-

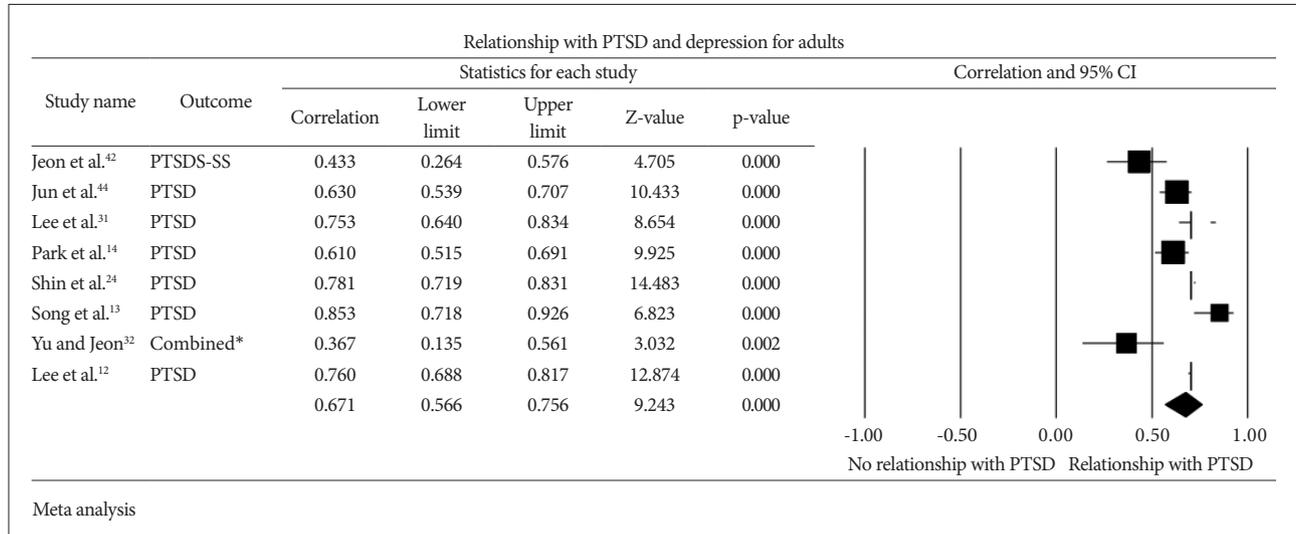


Figure 6. Depression and PTSD for North Korean adults. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

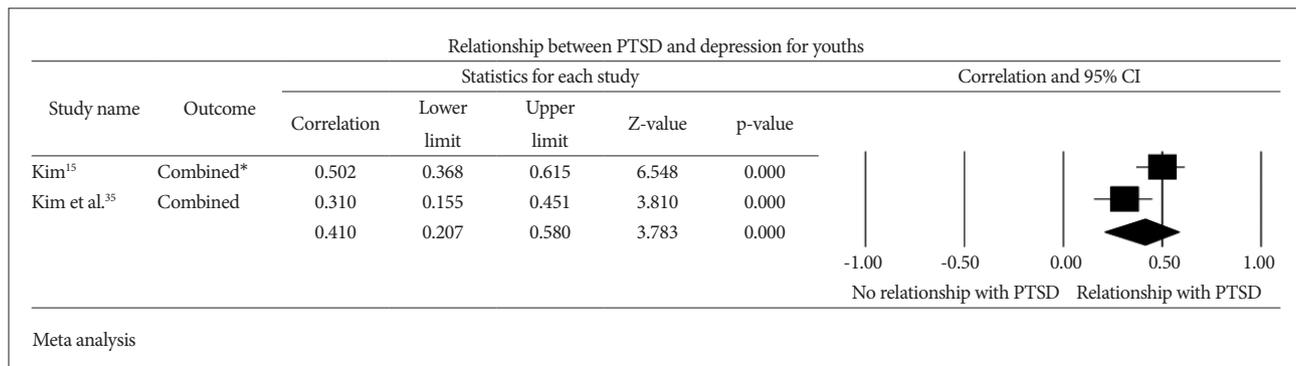


Figure 7. Depression and PTSD for North Korean youths. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

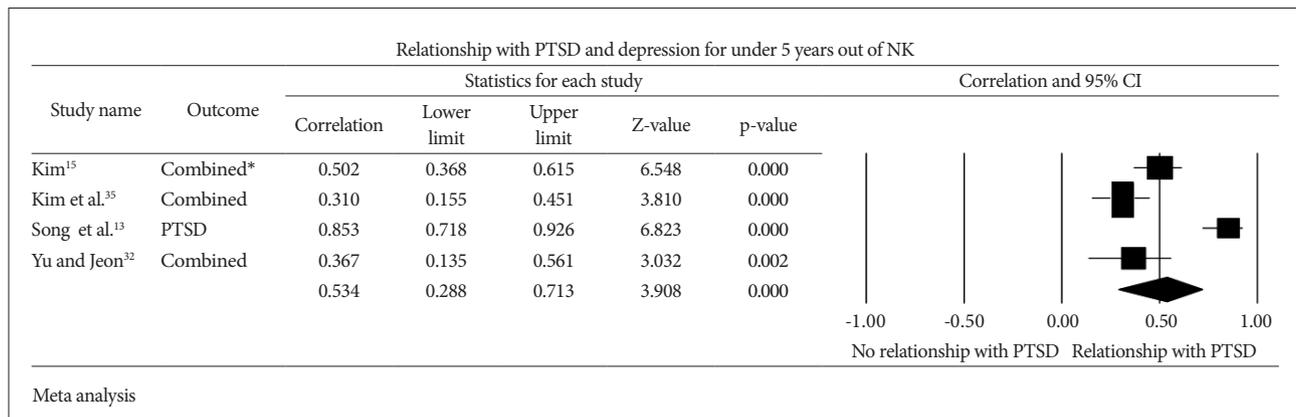


Figure 8. Depression and PTSD: less than five years outside North Korea. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

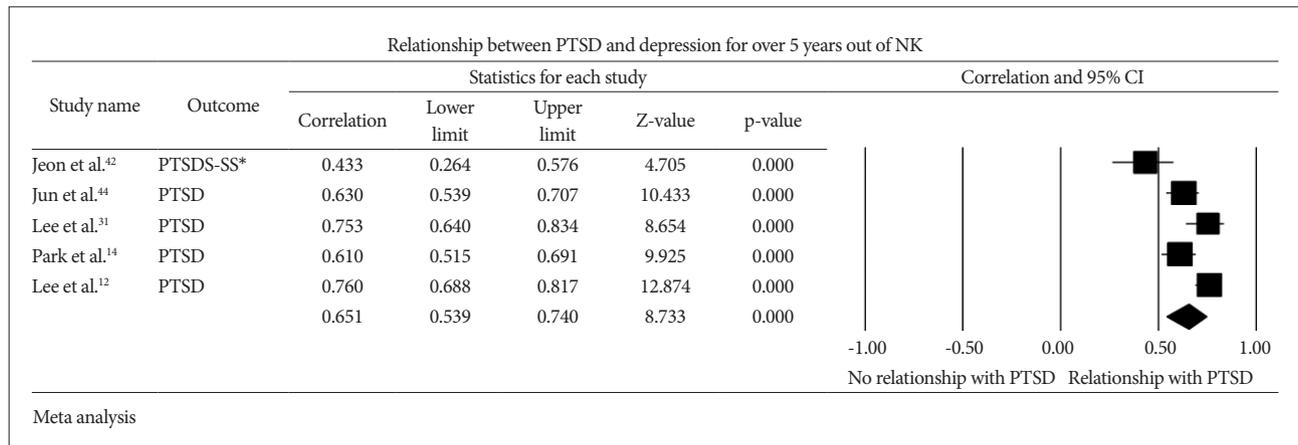


Figure 9. Depression and PTSD: more than five years outside North Korea. *denotes symptom severity PTSD: post-traumatic stress disorder.

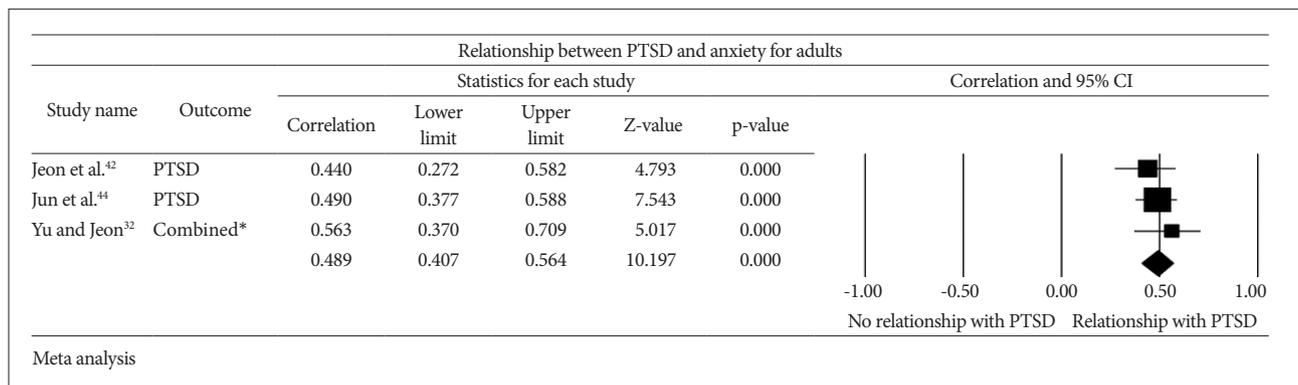


Figure 10. Anxiety and PTSD for North Korean adults. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

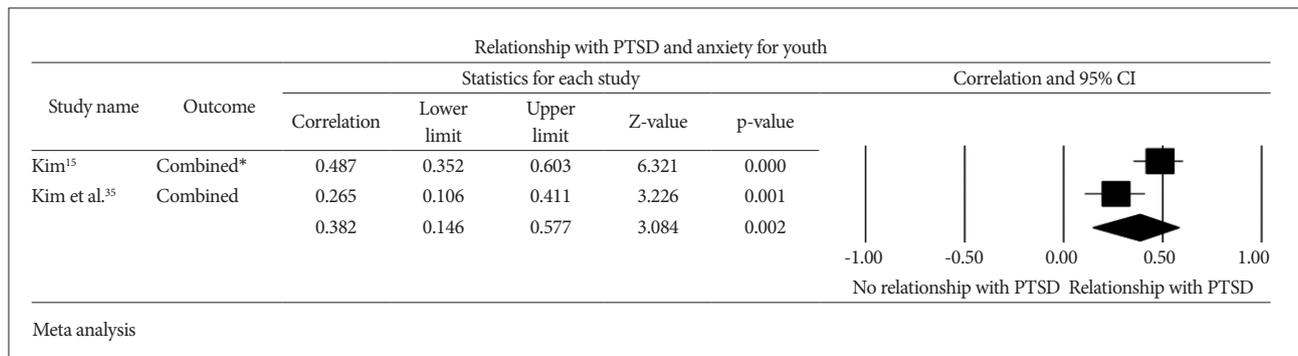


Figure 11. Anxiety and PTSD for North Korean youths. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

ture during the escape journey may be associated with anxiety in the present. Thus, the symptoms of PTSD among North Korean refugees may be associated with depression and anxiety in different ways.

The finding that the relationship between PTSD and depression was stronger than the relationship between PTSD and anxiety suggests that depressive symptoms may play a central role in the mental health of North Korean refugees. For North Korean refugees, unresolved trauma may be associated with

a psychological profile involving helplessness, hopelessness, and negative views about the self, others, and society,³⁶ rather than one involving fear and uncertainty. Specifically, refugees with symptoms of PTSD may doubt their ability to cope, grow, and thrive in their new lives, and may perceive a lack of support from their fellow citizens. This may be associated with poorer outcomes for these individuals, in the context of employment, marital status, income, and various other socio-demographic factors.³⁷ While there may be considerable over-

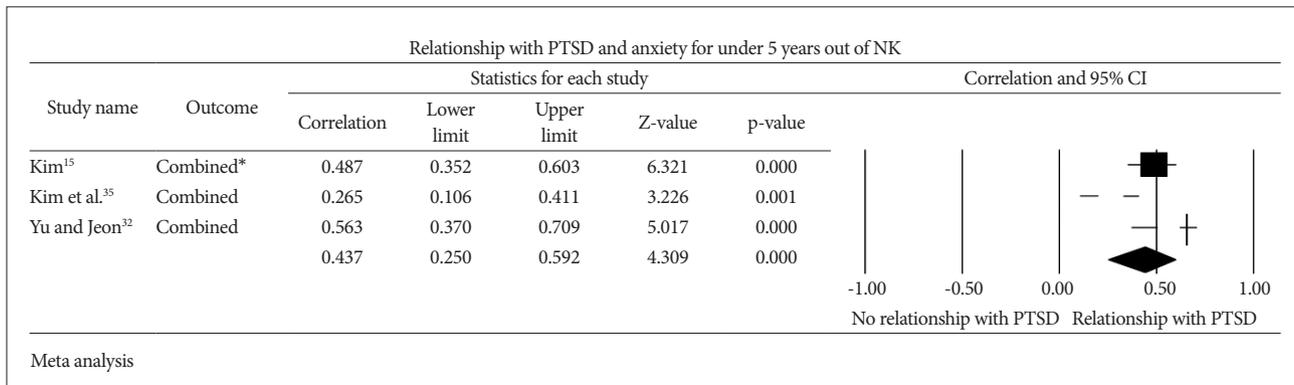


Figure 12. Anxiety and PTSD: less than five years outside North Korea. *PTSD presentations with multiple major symptoms. PTSD: post-traumatic stress disorder.

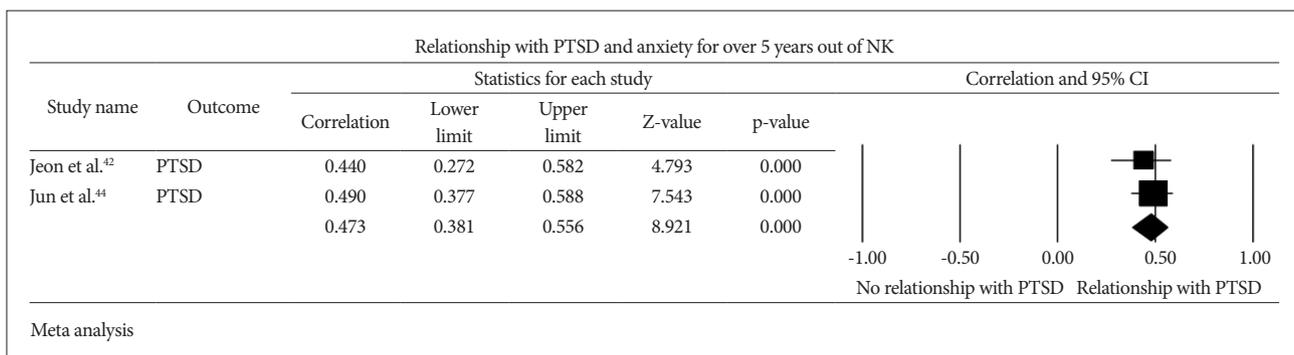


Figure 13. Anxiety and PTSD: more than five years outside North Korea. PTSD: post-traumatic stress disorder.

lap between co-morbid PTSD/depression, and PTSD/anxiety among North Korean refugees, the results of the present study suggest that depressive thinking is an important factor to target in the treatment of North Korean refugees with symptoms of PTSD.

The finding that the effects between PTSD and depression, and PTSD and anxiety were higher for North Korean adults, relative to youths suggests that longer exposure to trauma, and longer amounts of time within the North Korean regime lead to poorer mental health outcomes. Specifically, a longer amount of time in North Korea may be associated with greater instances of various types of trauma, such as political brainwashing, imprisonment, torture, and long-term famine, thus exacerbating the experience of mental illness. The finding that the effect between PTSD and depression, and PTSD and anxiety increased over time may be important for interventions aimed at improving the mental health of North Korean refugees. Perhaps for North Koreans with instances of unresolved trauma, a range of socio-cultural issues may develop over time, such as unemployment, low income, and discrimination.³¹ In the face of such issues, PTSD symptoms may become a greater source of depression over time.

Further, due to a pervading sense of fear and mistrust,¹¹ symptoms of PTSD itself may become a greater source of anx-

ety. The findings of the current study however, suggest that depression and anxiety should both be emphasised in care programs for North Korean refugees experiencing PTSD. Care programs for these individuals should emphasise the role of dysphoria and emotion dys-regulation in particular, as these features appear to be common across PTSD, and depressive disorders, and anxiety disorders.¹⁷⁻¹⁹ Furthermore, future studies should explore patterns of change in the relationships between PTSD, depression and anxiety over time among North Korean refugees, as this may provide important insights about factors that are associated with wellbeing, such as socio-cultural functioning.

The Juche philosophy is one that promotes self-reliance, yet paradoxically requires unquestioning loyalty and obedience on behalf of individuals. Daily life in North Korea involves strict adherence to the dictates of the regime, and constant exposure to political propaganda in the form of KWP propaganda.¹⁰ For this reason, a sense of autonomy and agency may be poorly developed among North Koreans. This contrasts markedly with the highly progressive, globalized, and competitive nature of South Korea society. For North Koreans with political-related trauma, the incongruence between what they have been told to believe throughout their whole lives and what they are now required to believe in South Korea may further

be associated with feelings of helplessness, hopelessness, and confusion. Thus a potential goal for the treatment of political-related trauma among North Korean refugees may involve identifying and remediating instances of incongruence, with the aim of enhancing self-efficacy and reducing depressive thinking.

The present study had several limitations which should be addressed. The decision to adopt a random-effects model for the meta-analysis was based on the finding of a non-significant *Q* statistic in the fixed-effects model. A problem with adopting a random-effects model upon this evidence is that the effect in question may truly be homogenous in the general population, but did not appear to be so due to the small number of studies included in the meta-analysis.^{30,38} However, given that the literature search was comprehensive, and included all available studies in the English language, this problem was likely unavoidable. The number of studies included in this paper created limitations in the moderation analyses. Specifically, although differences in the relationships between PTSD/depression and PTSD/anxiety were observed in studies involving youths/adults, and refugees with less than/more than five years outside of North Korea, the limited number of studies included did not permit assessment of population parameters. Therefore, these findings attract a degree of uncertainty.

The comparison of mental health outcomes between North Korean refugees with less than or more than five years outside of North Korea was arbitrary, and driven by the desire to compare short-term and longer term mental health outcomes among this population. This dichotomy however is somewhat simplistic, and does not take into account the potentially unique experiences faced by North Korean refugees with longer or relatively shorter transit times through China. Further, it was not possible to include gender as a modulating variable in the current meta-analysis, as none of the included studies provided a gender breakdown of the relationships between PTSD, depression, and anxiety. Given that stress responses may be different between the genders, this is an important area for future research.

The assessment of publication bias is an important component of meta-analysis.³⁸ In the present study, funnel plots revealed a pattern of data that was largely symmetrical. This suggests that publication bias was not present, although this judgement can be difficult to make.²⁴ Publication bias may be important in the context of the present area of research. It is possible that South Koreans are politically motivated to portray their Northern counterparts in a negative light² given that the reciprocal portrayal is practised by North Korea. This might therefore result in a bias in publication of data that confirms negative effects on the well-being of North Korean refugees. Political tension is strong between the two Koreas, and

propaganda is used by both nations as a tool for mass communication and negative stereotyping.^{2,11} However, the current authors are inclined to agree that publication bias was absent in the studies investigated. Specifically, given the fanning of points in the funnel plots, and the anecdotal and research evidence collected from North Korean defectors, it is unlikely that there is a substantial amount of evidence reporting non-significant findings that has not been published. Therefore, we conclude that the studies reviewed provide an accurate representation of the relationships between PTSD, depression, and anxiety among North Korean refugees.

An area that needs further research, and which was not considered in this study, is the role of socio-cultural factors in the persistence of mental health issues among North Korean refugees.

Research has shown that depression among North Korean refugees is associated with various socio-demographic factors, including marital status,³⁹ income,^{40,41} social support, and unemployment.³³ These factors likely mediate the relationships between PTSD, depression, and anxiety; once North Koreans arrive in South Korea.⁴²⁻⁴⁵ However, this is an entirely different research question that was not a focus area within the current meta-analysis. Further, it is not currently known whether longer transit times through China cause more severe depression and anxiety among North Korean refugees, or if indeed this association is mediated by other factors related to evading capture in China, such as paranoia.⁴⁶ Thus longitudinal studies could be used to address this question. Therefore, future studies should explore this area, as well as the role of socio-cultural factors in the onset and maintenance of psychopathology among North Korean refugees.

In conclusion, the results of the present meta-analytic study suggest that a relationship exists between PTSD and depression, and PTSD and anxiety. Further, the relationship between PTSD and depression, $r=0.63$ appears to be greater than the relationship between PTSD and anxiety, $r=0.51$. This is important, as a greater focus on depressive symptomatology among North Korean refugees reporting histories of trauma may lead to better mental health outcomes, improved quality of life, and greater socio-cultural adjustment.

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