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Beyond motivation: identifying targets for intervention to increase hearing aid use in adults

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\textbf{ABSTRACT}

\textbf{Objective:} The present study investigated: (a) how motivated patients are to use their hearing aid, and (b) whether post-motivational variables (e.g. action planning, coping planning) have anything to offer in terms of developing interventions to boost hearing aid use.

\textbf{Design:} participants completed a questionnaire designed to tap Health Action Process Approach constructs prior to their hearing aid prescription and fitting. Study sample: Sixty-seven patients attending NHS audiology clinics.

\textbf{Results:} Participants reported very strong intentions to use hearing aids (Median = 7.00 Q1 and Q3 = 6.67, 7.00, on a +1 to +7 scale) and high self-efficacy (Median = 7.00, Q1 and Q3 = 6.00, on a +1 to +7 scale) leaving little room for improvement. In contrast, participants reported moderate levels of post-motivational variables (action planning Median = 4.25, Q1 and Q3 = 1.13, 7.00 and coping planning Median = 2.75, Q1 and Q3 = 1.00, both measured on +1 to +7 scales) thereby showing significant scope for change.

\textbf{Conclusions:} Future interventions to increase hearing aid use should focus on ensuring that patients’ motivation is translated into action, rather than further trying to boost motivation.

\section*{Introduction}

The number of UK adults with hearing impairment is predicted to rise from 10 million in 2011 to 14.5 million by 2031 (Action on Hearing loss 2011a). Hearing impairment is associated with negative outcomes including poor quality of life (Chia et al. 2007; RNID 2004); low self-rated health (Mulrow et al. 1990); cognitive decline (Lin et al. 2013); and feelings of depression, anxiety, frustration, loneliness and fatigue (Gopinath et al. 2009; Gopinath et al. 2012). Hearing impairment was ranked fifth for global disease burden in 2013 (Vos et al. 2015).

The principal treatment for permanent hearing loss is hearing aids, but rates of non-use vary from 5% to 40% (Ferguson et al. 2017). Research attention has been drawn to developing interventions that will address sub-optimal use of hearing aids. However, Barker, Mackenzie, Elliott, Jones, and de Lusignan’s systematic review showed that interventions designed to boost hearing aid use had limited success. Studies included in their review suffered poor methodological quality, with the majority having potential biases in performance (participants were not blinded), detection (outcomes were not blinded) and/or selection (no details about randomisation). Moreover, all 31 of the interventions that were targeted at the individual were designed to enhance motivation only for example, by providing information about the psychosocial impacts of hearing loss, the benefits of using hearing aids, or demonstrating how to use a hearing aid, to boost intention and self-efficacy (Barker et al. 2014).

Theories of motivation, such as self-determination theory (Deci and Ryan 1985), the health belief model (Becker 1974) and theory of planned behaviour (Ajzen 1991) have been applied to hearing aid use (Meister et al. 2014; Ridgway et al. 2015; Saunders et al. 2013). According to these theories, increases in motivation (or “behavioural intention”) are sufficient to bring about change behaviour (Armitage and Conner 2000), but theories of motivation have been criticised due to the weak correlation between motivation and subsequent behaviour (Armitage and Conner 2001).

Stage models such as the Transtheoretical Model (TTM; Prochaska and Diclemente 1983) try to identify groups of people who may be motivated to engage in a particular behaviour and considers people who are motivated but have not yet changed their behaviour. Stage models have been applied to hearing aid uptake (Laplante-Lèvesque et al. 2013), but have been criticised for making arbitrary distinctions between the five different stages of change and for a lack of information about how people make transitions between stages (e.g. Armitage 2009; Sutton 2005).

However, the focus on motivation to promote hearing aid use may have been misguided. The evidence increasingly shows that people who have been prescribed a hearing aid are close to the maximum on measures of motivation, including behavioural intention (Armitage et al. 2017; Meister, Grugel, and Meis 2014),
self-efficacy (Armitage et al. 2017) and positive outcome expectancies (Meister et al. 2008), with respect to using a hearing aid.

One model that provides an alternative to an approach focussed on motivation is the Health Action Process Approach (HAPA, Schwarzer 2008). The HAPA model provides a theoretical framework for the adoption and maintenance of behaviours (Schwarzer 2008). The HAPA model posits two phases. The first phase is the motivational phase where the individual forms an intention to change their behaviour and is characterised by variables such as behavioural intention and self-efficacy. The second phase is the volitional phase, which is characterised by variables such as action planning (planning when to perform the behaviour) and coping planning (planning how to deal with barriers).

The principal tenets of the HAPA, and in particular the distinction between motivation and volition, have been supported across a variety of health behaviours, including physical activity (Perrier et al. 2012; Hattar, Pal, and Hagger 2016), healthy eating (Radtke et al. 2014), smoking cessation (Radtke et al. 2012), alcohol consumption (Murgraff et al. 2003) and in chronic illness and disability (Schwarzer et al. 2011). To date, however, the HAPA model has not been applied in the domain of hearing health care. For the first time, the present study used components of the HAPA model to inform future intervention development. It was hypothesised that adult hearing aid patients would be highly motivated to wear hearing aids, but would report a deficit in volitional variables that have shown to be important in translating that motivation into action.

Method

Participants

Sixty-seven participants were recruited from three NHS audiology clinics in England. Patients who met the inclusion criteria (>18 years of age, reporting hearing difficulties and audiometrically eligible for a hearing aid) were able to take part and no financial incentive to participate was offered. Written consent was obtained from participants by the research team prior to participation. Ethical approval was gained from the London – City and East Research Ethics Committee (reference number 15/LO/0367) and local NHS Trust approval.

Participants’ ages ranged from 32 to 90 years old with a median of 72 years old (Q1 = 61.3, Q3 = 78.0 years old). Thirty-six (53.7%) were male and fifty-four (91.5%) were white British. The duration for which participants had experienced hearing difficulties ranged from 3 months to 60 years with a median of 8.5 years (Q1 = 2 years, Q3 = 12 years). Twenty-five (37.9%) participants had regularly worn a hearing aid in the past but had stopped using it and forty-one (62.1%) had never owned or regularly worn a hearing aid before.

Study design

The study had a cross-sectional design. Data were obtained through a questionnaire administered before participants’ hearing aids were prescribed and fitted. The questionnaire was completed in the clinic immediately after the initial assessment or later at home (to be returned by post).

Measures

The questionnaire operationalised the two phases from the HAPA model. The motivational phase was operationalised through questionnaire items of behavioural intention and action self-efficacy; the volitional phase was operationalised through questionnaire items of action planning and coping planning. All fourteen items were answered on seven-point (+1 to +7) Likert-scales and were adapted for hearing aid use from the original scales (Armitage et al. 2017; Sniehotta et al. 2005).

The questionnaire items of behavioural intention was adapted from Armitage et al. (2017) using participants’ responses to three items: “I intend to wear a hearing aid as advised definitely do not-definitely do”, “I want to wear a hearing aid as advised definitely do not-definitely do” and “How likely is it that you will wear a hearing aid as advised? not likely-very likely”.

Action self-efficacy was adapted from Armitage et al. (2017) and was assessed using responses to three items: “My wearing a hearing aid as advised would be difficult-easy”, “I believe I have the ability to wear a hearing aid as advised definitely do not-definitely do” and “How confident are you that you will be able to wear a hearing aid as advised? not at all-very much so”.

The measure of action planning was adapted from Sniehotta et al. (2005). The four items were answered on 7-point scales ranging from strongly disagree to strongly agree. The item stem “I have made a plan regarding …” was followed by “…when to wear my hearing aid”, “…where to wear my hearing aid”, “…how often to wear my hearing aid,” and “…in which situations to wear my hearing aid.”

Coping planning was similarly adapted from Sniehotta et al. (2005). Participants responded to the four items on 7-point scales ranging from strongly disagree to strongly agree. The item stem “I have made a plan….” was followed by “…regarding what to do if something interferes with my plans to wear my hearing aid”, “…regarding how to cope with possible setbacks to wearing my hearing aid”, “…regarding how to wear my hearing aid in difficult situations” and “…to prevent lapses in wearing my hearing aid”.

Hearing sensitivity (i.e. pure tone hearing threshold level) was obtained from the medical records and was the mean of 500, 1000, 2000, and 4000 Hz for the better ear.

Procedure

Patients who had been referred for a hearing assessment by their general practitioner were invited to take part in the study via a letter and an information sheet posted to them prior to their hearing assessment appointment. Audiologists screened patients for their eligibility to be included in the study during their hearing assessment appointment. If patients were eligible the audiologist introduced the patient to the researcher. Once patients had consented they completed the questionnaire alone. Patients completed the questionnaire between May 2015 and September 2015. Recruitment rates and reasons for refusal and withdrawal were recorded.

Data analysis

Descriptive statistics on participant characteristics, mean, Standard Deviations (SDs), median and interquartile range were computed. The data were ordinal and skewed and so a Friedman test was used to compare scores on all the variables. Wilcoxon Signed-Rank Tests were used to compare each motivational variable with each volitional variable. The effect sizes (r) for differences between the motivational and volitional phases were computed. Zou’s (2007) procedures were used to assess whether the differences in effect sizes were statistically significant.
Results

Recruitment and retention

Recruitment and follow-up rates were lower than expected. Figure 1 presents a diagram of the study flow. Of the 253 people who were screened and invited to take part in the study, 204 participants were assessed for eligibility. Forty-nine participants were not assessed for eligibility was due to the participants cancelling, rescheduling or not attending their appointment. Of those eligible to take part in the study, 57 were excluded as they did not meet the audiometric criteria to be eligible for a hearing aid, 33 declined to participate (45.5% due to lack of interest, 15.2% due to lack of time, and 21.2% due to ill health). Sixty-seven (53.6%) of 125 eligible participants who consented to take part in the study completed and returned the questionnaire.

Reliability of measures

The Cronbach’s $\alpha$ for the three intention items in this study indicated good internal reliability ($\alpha = 0.77$). Cronbach’s $\alpha$ for the three action self-efficacy items in this study was low ($\alpha = 0.50$). Removal of the item: “My wearing a hearing aid as advised would be difficult-easy”, increased the internal reliability to $\alpha = 0.77$, and so this item was removed from subsequent data analysis. The Cronbach’s $\alpha$ for the three action planning items in this study indicated that internal consistency of the action planning scale was high ($\alpha = 0.95$). The Cronbach’s $\alpha$ for the three coping planning items in this study indicated that the internal consistency of the coping planning scale was high ($\alpha = 0.96$).

Participant characteristics

Table 1 summarises the characteristics of participants who were included in the study. The mean hearing sensitivity for the better ear was 48 dB HL (SD = 19 dB). 54.6% and 30.3% had a mild loss (26–40 dB HL in the better ear) and moderate hearing loss (41–55 dB HL in the better ear), respectively. 12.1% had a moderately severe loss (56–70 dB HL in the better ear) and 3% had a severe loss (71–90 dB HL in the better ear).
Motivational and volitional constructs

Participants reported being very highly motivated to use their hearing aids, with 71.9% and 40.0% of people scoring at the maximums of the intention and self-efficacy scales, respectively (\(\text{Median}_{\text{intention}} = 7.00\) Q1 and Q3 = 6.67, 7.00; \(\text{Median}_{\text{action self-efficacy}} = 7.00\) Q1 and Q3 = 6.00, 7.00) and the median scores were at the maximums of the scales. In contrast, mean scores for volitional variables were lower (\(\text{Median}_{\text{planning}} = 4.25\) Q1 and Q3 = 1.13, 7.00; \(\text{Median}_{\text{coping planning}} = 2.75\) Q1 and Q3 = 1.00, 5.56), with just 27.7% and 16.7% of participants scoring the maximum possible values for action planning and coping planning, respectively. Thus, consistent with predictions, participants’ motivation was higher than their volition.

A Friedman test was conducted, to compare scores on all the variables. This analysis revealed significant differences between the scores on all variables \(F(3, 58) = 40.47, p < 0.001\). Both the volitional constructs (action and coping planning) scored significantly lower than the motivational constructs (intention and action self-efficacy). The Wilcoxon Signed-Rank Tests showed that action planning (volitional phase) scores were significantly lower than either intention (motivation phase), \(Z = -5.87, p < 0.001\), or action self-efficacy (motivation phase), \(Z = -5.61, p < 0.001\). Coping planning scores (volitional phase) were significantly lower than either intention (motivation phase), \(Z = -6.38, p < 0.001\), or action self-efficacy (motivation phase), \(Z = -6.34, p < 0.001\) (see Table 2).

The effect size for the differences between intention and self-efficacy (motivational phase) were small to medium (\(r = 0.20\)) as were the differences between action planning and coping planning (volitional phase; \(r = 0.27\)). In contrast, the differences between motivation and volitional variables were large (\(r_s > 0.50\)). Zou’s (2007) procedures were used to assess whether these differences in effect sizes were statistically significant (Table 2). These analyses revealed that the differences between the motivational and volitional phases were significantly stronger (\(p < 0.05\)) than the differences between variables within the phases.

Discussion

This is the first study to have applied the HAPA in the domain of hearing health care. The principal findings are: (a) adult patients attending an NHS audiology clinic were highly motivated in terms of the HAPA model (intention and action self-efficacy) to use a hearing aid, and (b) there is evidence for a distinction between the motivational and volitional phases. The following discussion focuses on the implications of the findings for theory and practice.

Distinction between the motivational and volitional phase

Participants reported being highly motivated and confident they could use a hearing aid as advised, consistent with Armitage et al. (2017). This high level of motivation in participants was expected because, by definition, the participants had both acknowledged the possibility of a hearing loss and attended the hearing assessment appointment (Armitage et al. 2017). The high level of motivation in adult participants attending an audiology clinic may go some way towards explaining why previous interventions reviewed by Barker et al. (2014), which largely focussed on boosting motivation, were ineffective. In contrast, participants were relatively low in volition and did not report making plans to use their hearing aid or to overcome potential barriers to using their hearing aids. For the first time, this provides evidence for a distinction between the motivational and volitional phases in relation to hearing aid use. Lower scores on the volitional variables compared to motivational variables are unlikely to be due to lack of knowledge of using a hearing aid in difficult situations, as possible setbacks and potentially difficult situations are highlighted during routine consultations. Thus, interventions may need to focus on increasing patients’ use of volitional processes to help translate high motivation into behaviour. One possible approach would be to encourage people to form implementation intentions (“if-then plans”), which are known to help people translate motivation into action (see Gollwitzer 1999) in a range of behaviours from reducing suicidal ideation and behaviour (Armitage et al. 2016) to increasing physical activity (e.g. Epton and Armitage 2017), but not yet in relation to hearing aid use.

Limitations

The major limitation associated with the present study was that recruitment proved challenging, with many potential participants reporting that a lack of interest in the research was their main reason for declining. Future studies would need to address this issue and one approach would be to spend more time with patients to improve recruitment materials, such as patient information sheets and advertising. Moreover, it is notable that we did not offer incentives for participation, which would likely have boosted the recruitment rate (McDonald et al. 2006). Nevertheless, it is valuable to know likely recruitment rates for future research with this population, and potential strategies for overcoming the barriers. The study looked at the motivational and volitional variables pre-fitting future studies should investigate the longer-term trajectories of motivation and volition

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### Table 1. Characteristics of participants (Means and Standard Deviations) and medians and interquartile ranges of the HAPA component.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean, Standard Deviations (SDs)/Q1, Median, Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTA better ear</td>
<td>66</td>
<td>47.98 (SD 18.91)</td>
</tr>
<tr>
<td>Intention</td>
<td>64</td>
<td>6.67, 7.00, 7.00</td>
</tr>
<tr>
<td>Action Self-Efficacy</td>
<td>65</td>
<td>6.00, 7.00, 7.00</td>
</tr>
<tr>
<td>Action Planning</td>
<td>65</td>
<td>1.13, 4.25, 7.00</td>
</tr>
<tr>
<td>Coping Planning</td>
<td>66</td>
<td>1.00, 2.75, 5.56</td>
</tr>
</tbody>
</table>

### Table 2. The Wilcoxon Signed-Rank Tests for the motivational and volitional constructs.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Action Planning</th>
<th>Coping Planning</th>
<th>Intention</th>
<th>Action Self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>1.13 Q1 = 4.25, Q3 = 7.00</td>
<td>z = 3.17* r = 0.39</td>
<td>z = 5.87** r = 0.72</td>
<td>z = 5.61** r = 0.69</td>
</tr>
<tr>
<td>Coping planning</td>
<td>Median = 1.00 Q1 = 2.75, Q3 = 5.56</td>
<td>z = 6.38** r = 0.78</td>
<td>z = 6.33** r = 0.77</td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>Median = 6.67 Q1 = 6, Q3 = 6</td>
<td>z = 2.24 r = 0.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action self-efficacy</td>
<td>Median = 6.00 Q1 = 6, Q3 = 6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Descriptive statistics are presented along the diagonal. Where effect sizes (\(r\)) have different subscripts they differ significantly (\(p < .05\)) from one another according to Zou’s (2007) test.

*\(p < .01\)

**\(p < .001\)
post-hearing aid fitting. Another limitation is potential biases from individuals who declined due to lack of interest, these individuals may also have been less motivated to use hearing aid and may have scored lower on the motivational variables compared to the people who participated in the present study. These individuals who declined due to lack of interest may be the ones who require further intervention to promote sustained hearing aid use. Further research is required to determine whether interventions for these groups of disinterested participants should target motivation or volition. However, it is worth noting that these disinterested participants were sufficiently motivated, whether intrinsically or extrinsically by significant others, to seek help for their hearing and attend a hearing assessment appointment, we would expect issues in hearing aid use to also be related to volition.

The construct validity for the questionnaire items for the constructs from the health action process approach model was not assessed prior to the study; therefore, it is possible the items may have low construct validity and may not have measured the constructs adequately. However previous studies have demonstrated empirical evidence for the validity of the items measuring the health action process approach for a variety of different health behaviours in diverse settings (Schwarzer 2008).

Conclusions

This is the first study to have applied the HAPA model to the domain of hearing healthcare. Participants attending a hearing assessment were already highly motivated to use a hearing aid but low on volition. There seems to be little scope for boosting motivation further but plenty of scope for changing the volitional variables. Further research is needed to specify the role of volitional variables measured pre and post-hearing aid fitting in predicting hearing aid use and using behaviour change techniques to build interventions around volitional variables to boost hearing aid use.

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No potential conflict of interest was reported by the authors.

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References


Becker, M. H. 1974. The Health Belief Model and Personal Health Behavior.: Slack, University of Michigan, USA.


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