

Medical practitioners' attitudes to hearing rehabilitation for older adults

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Key Words

Older adults; medical practitioners; hearing aids; hearing rehabilitation; Health Belief
Model; self efficacy

Abbreviations

HBM - Health Belief Model

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Abstract

Objective: Medical practitioners have the potential to play a significant role in older adults' help seeking behaviour in relation to hearing rehabilitation. The current study aimed to look at attitudinal factors that influence practitioners' decisions to discuss hearing difficulties with older patients and refer them for hearing rehabilitation.

Design: A questionnaire based on constructs from the Health Belief Model was used to examine factors that may influence practitioners' referral decisions.

Study Sample: One hundred and ten practitioners' attitudes to hearing rehabilitation were examined.

Results: The results indicated that practitioners have a high level of awareness about their older patients' susceptibility to hearing loss, and a good understanding of the severity of the associated impacts on older adults' lives. Although practitioners acknowledged the theoretical benefits of hearing rehabilitation, many appear less certain about the potential for actual benefit for their older adults. Barriers to referral include negative perceptions about how older patients prioritise hearing, and patients' ability to afford and adapt to the use of hearing aids.

Conclusions: Additional research and education targeted at these areas may be beneficial for medical practitioners for increasing referral behavior and improving discussions about hearing rehabilitation with their older patients.

Hearing impairment is recognized as a common problem associated with ageing and shows increasing prevalence with age. Worldwide estimates have reported prevalence rates of 60 – 66% for adults aged over 60 years (Davis, 1989; Cruickshanks et al, 1998; Wilson et al., 1999) with significantly higher incidences of hearing impairment reported for males (73%) than females (49%) (Cruickshanks, Wiley et al, 1998). Furthermore, in an investigation of hearing impairment in a sample of 48-92 year olds, Cruickshanks et al (1998) found that the risk of hearing impairment increased by approximately 90% for every 5 years of age. As many countries have an ageing population, such figures indicate that hearing impairment will increasingly represent a significant concern for health professionals.

Hearing impairment negatively impacts on communication, on participation in a range of daily activities, and is associated with reduced quality of life (Dalton et al, 2003; Chia et al, 2007) and social isolation (Arlinger, 2003). Many of the negative impacts associated with hearing impairment in older adults can be mediated or minimized through access to hearing rehabilitation, including the provision of hearing aids, cochlear implants, assistive listening devices, and/or communication training (see Laplante-Lévesque et al, 2010 for a review). However, of those older adults with hearing impairment, the majority do not seek help for their hearing (Dalton, Cruickshanks et al., 2003; Cox et al, 2005) and those who do seek help wait ten years on average before taking action (Davis et al., 2007). In a bid to address the poor uptake of hearing services, research has focused on examining factors that

influence older adults' decision making when considering hearing rehabilitation. One such factor, the role of others in older adults' decisions, has been previously noted in hearing rehabilitation research (e.g. Brooks et al, 2001; Donaldson et al., 2004; Stark & Hickson, 2004; Scarinci et al, 2008) however little attention has been paid to influences that may be present from non-family members. Medical practitioners are generally considered to be in favorable positions to educate and inform older adults about health issues (Sims et al, 2000), and thus are the focus for this study.

The potential for medical practitioners to be involved in health promotion activities has previously been discussed (Raupach et al, 2001). Older adults see practitioners as credible sources of information (e.g., Booth & Bauman et al, 1997; and see Sims, Kerse et al, 2000) and their support and advice is recognised as a motivator for changes to health behaviours (e.g., Horne et al, 2010; Kerse, Flicker et al, 1999).

The medical practitioner's role as a trusted source of information means that he or she often becomes the first point of contact for people seeking referral or advice about specialist health treatments including hearing rehabilitation. In fact, a recent Australian study reported that over a third of older people with a known hearing impairment identified medical practitioners as their first contact in relation to hearing matters (Schneider et al, 2010). However, in the absence of such patient directed discussions, the study found that practitioners were generally unlikely to spontaneously discuss hearing with their older patients. Furthermore, Wallhagen and Pettengill (2008) reported that 85% of 91 older patients reported receiving no spontaneous advice from their primary care providers regarding hearing, and that patient directed enquiries were sometimes dismissed by the practitioners. Thus, although practitioners are in a unique position to play a significant role in decision

making around hearing rehabilitation, many appear not to be actively encouraging help seeking either through referrals or hearing related discussions with patients. Further information is required regarding factors that may be influencing practitioners' decisions to refer older adults for hearing rehabilitation.

The current study utilized the constructs of one of the most widely used health models, the Health Belief Model (HBM; Rosenstock et al, 1988), in order to examine medical practitioners' attitudes relating to hearing rehabilitation. Developed to investigate and predict individuals' decisions around specific health behaviours, the HBM describes health decisions in relation to the perceived threat associated with a condition and the outcome expectations associated with participation in a specific preventative or treatment behaviour (see Figure 1).

<Insert Figure 1 near here>

The HBM is generally used in investigations of patient attitudes regarding decisions relating directly to their own health. For example, the HBM has previously been used to study hearing impaired older adults' attitudes towards hearing rehabilitation (e.g., see van den Brink et al, 1996), looking at factors that may influence individual help seeking behaviours. However, health models like the HBM have also been suggested as relevant tools for the investigation of medical professionals' decisions about health treatment and referral options for their patients (Marteau & Johnston, 1990). As such, the model provides a useful framework for investigating the factors influencing practitioners' decisions to discuss hearing rehabilitation with their older patients.

For example, with respect to medical practitioners' attitudes to hearing rehabilitation referral, investigation of threat perceptions would include perceptions of patient susceptibility and the severity of hearing impairment (i.e., how "likely" it is that older adults may be affected by a hearing impairment?; how serious are the consequences of having a hearing impairment for older adults?). In addition, cost-benefit analysis of outcome expectations would examine attitudes related to perceived benefits and barriers for patients (e.g., Will hearing rehabilitation assist in overcoming difficulties associated with hearing impairment for older adults?; Is hearing rehabilitation difficult or costly for older adults?) as well as practitioners' perceived self efficacy in relation to referral (e.g., Do medical practitioners feel comfortable referring patients for hearing rehabilitation?).

The HBM predicts that medical practitioners will be more inclined to refer older patients for hearing rehabilitation if they believe that their patients are at a high risk of having a hearing impairment and that a hearing impairment will negatively impact their lives. Furthermore, medical practitioners will be more likely to refer older patients if they believe that hearing rehabilitation will mediate negative consequences for their older patients, that rehabilitation benefits outweigh any perceived difficulties that patients may experience, and if they feel confident in their ability to discuss the issues and make referrals. Thus, we argue that an understanding of medical practitioners' attitudes in relation to each of the HBM constructs is likely to be beneficial in identifying potential areas of concern and, subsequently, areas in need of further support and/or education.

The aim of the study was to use the HBM to investigate the attitudes of medical practitioners towards hearing rehabilitation referral in relation to their older patients.
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It was envisaged that a better understanding of practitioners' attitudes may assist with the future development of strategies to improve referral for and the uptake of hearing rehabilitation by older adults.

Method

Participants

Medical professionals were recruited during two medical practitioner conferences held in Sydney (New South Wales) and Melbourne (Victoria), Australia. These events are aimed specifically at practitioners and assist them to fulfill their ongoing professional development requirements; medical practice managers and practice nurses also attend, but were not targeted for recruitment. Potential participants who identified that they had no contact with the age group of interest (i.e., over 60s) (e.g., pediatric and obstetric specialists) were excluded from participation. In total, 104 participants were recruited from the two events, with an additional six medical practitioners participating in the study online. On average, participants reported that nearly half of their patient load was aged 60 years or more, although reported proportions did vary widely between respondents ($M = 42\%$, $SD = 23\%$).

Demographic information was completed by 96 of the respondents (40 males, 56 females) with a reported mean age of 54 years ($SD = 11$ years). Participants had a range of experience, with an average of 25 years practicing ($SD = 12$ years).

A breakdown of participants' location was conducted by practice postcode. The results showed a good spread across most Australian states and territories (New Gilliver, M., & Hickson, L. (2011). Medical practitioners' attitudes to hearing rehabilitation for older adults. *International Journal of Audiology*, 50(12), 850–856.

South Wales 45%; Australian Capital Territory 3%; Victoria 18%; Queensland 14%; South Australia 4%; Western Australia 10%; Tasmania 5%). This sample is reasonably representative of Australian States' and territories' population ratios according to 2001 census data: (NSW 34%; ACT 1.6% ; VIC 25% ; QLD 18%; SA 7.8% ; WA 9.8%; TAS 2.4%) .

Materials

As there has been no similar previous investigation of medical practitioners' beliefs in relation to hearing rehabilitation, a questionnaire was developed specifically for this study (A copy of the questionnaire can be found in Appendix, A, and is available in the online in the online version of the journal. Please find this material with the direct link to the article at: "[http://www.informaworld.com/\(DOI number\)](http://www.informaworld.com/(DOI number))"). Results are presented for 30 items comprising of a mix of open-ended questions and Likert scale items. Twenty-six questions specifically related to the HBM constructs of perceived threat (9 questions) and outcome expectations (17 questions), and four additional questions related to practitioners' experiences with referral. Each of these areas is now outlined in detail.

PERCEIVED THREAT

Three open ended questions and six Likert scale items relating to perceived threat were developed to examine factors that may underlie practitioners' motivation to refer older patients for hearing rehabilitation. Open ended questions were used to provide a measure of practitioners' day-to-day interaction with older patients and Gilliver, M., & Hickson, L. (2011). Medical practitioners' attitudes to hearing rehabilitation for older adults. *International Journal of Audiology*, 50(12), 850–856.

their perceptions of the need for hearing rehabilitation referral in this group. Practitioners were asked to estimate the proportion of older patients they treated [Q1], the prevalence of hearing loss in their older patients [Q2], and the percentage that had sought help for hearing problems [Q4].

The six Likert scale items (shown in Table 1) were used to further investigate participants' perceptions of susceptibility and severity. Practitioners' perceptions of their older patients' susceptibility for hearing impairment were examined through two items [Qs 11, 25]. Questions about perceptions of severity were based on the two factors identified by van den Brink et al (1996) as being relevant: namely the impact of hearing loss on the individual [Qs 7, 13], and the perceived need to rehabilitate hearing loss in older age [Qs 5, 12].

OUTCOME EXPECTATIONS

An additional open-ended question and 16 Likert scale items relating to outcome expectation were used to examine practitioners' perceptions of factors associated with the process of referring older adults for hearing rehabilitation. The open-ended question asked practitioners to make a direct estimate of the proportion of their older patients expected to reasonably benefit from hearing rehabilitation [Q3]. The Likert scale items (shown in Table 2) were developed to investigate the benefits, barriers, and self efficacy perceptions which may influence medical practitioners' decisions to refer older patients for hearing rehabilitation. This included seven items regarding practitioners' beliefs about the potential ability of older adults' to benefit from referral (e.g. general effectiveness of hearing rehabilitation tools [Qs 6, 22, 27]; the perceived actual benefit for older patients' [Qs 16, 17, 24, 26]), and six items examining factors

that may be viewed as potential barriers (e.g., stigma [Qs 15, 21,10]; cost [Q14]; perceived ability of patients to adjust to hearing aids [Q8]; perceived priority placed on hearing by patients in relation to overall health [Q20]). In addition, three items investigated practitioners' self efficacy when referring older adults for rehabilitation (e.g. perceived ease of referral [Qs 18, 23]; and patients' likelihood of acting on relevant advice [Q19]).

REFERERAL EXPERIENCES

Four additional open ended questions were included at the conclusion of the questionnaire seeking general feedback about participants' experiences with hearing rehabilitation referral.

Procedure

Ethics approval was given by the Australian Hearing Human Research Ethics Committee. Written consent was not sought from individual participants as no identifying data was collected. Participants were approached at conferences, when not in session, and invited to complete the questionnaire, with the majority of participants completing the questionnaire unassisted. Completed questionnaires were generally returned to the researcher (or a representative) within 30 minutes of distribution. Following data collection at the conferences, additional participants were invited via email to complete the online form of the questionnaire.

Analysis Procedures

Participants' responses to each of the 23 Likert scale items were converted to percentages for each of the 5 response options. Responses to the referral experience questions [Q28-31] were coded by the researcher (using nViVo software) to identify common responses and themes. The majority of these responses will not be discussed in the current study as they fall outside its focus. However, for those instances where spontaneous responses related to the HBM constructs under investigation, they are included in the following related section.

Results

Responses to HBM items

PERCEIVED THREAT

< Insert Table 1 near here>

Perceived susceptibility. Medical practitioners estimated that nearly half of their patients over the age of 60 had a hearing loss [Q2] ($M = 46\%$, $SD = 25\%$, Range = 5-100%). Practitioners also recognized low rates of help seeking behaviour, estimating that less than a quarter of older patients sought hearing rehabilitation [Q4] ($M = 21\%$, $SD=19\%$). Practitioners' responses to other perceived threat items are shown in Table 1. Participants did not necessarily consider that hearing loss was inevitable with age [Q25] with 41% agreeing this was the case. They were slightly more likely to agree than disagree that almost all of their older patients have hearing difficulties [Q11].

Perceived severity. Eighty percent of participants either agreed or strongly agreed that their older patients' hearing was a high priority for them [Q5]. Nearly all (99%) acknowledged difficulties that poor hearing may have for patients' relationships with spouse/family [Q7] and most practitioners (93%) agreed that hearing loss has the potential to seriously impair independence [Q13]. Furthermore, many participants (60%) believed that hearing loss in old age does not always require amplification [Q12].

OUTCOME EXPECTATIONS

Outcome expectation items investigated practitioners' perceptions regarding the benefits of referral, potential barriers to referral, and their confidence in the referral process with respect to older adults (see Table 2).

<Insert Table 2 near here>

Perceived benefits. Medical practitioners reported that they believed that less than a third of their older patients would benefit from hearing rehabilitation [Q3] ($M = 31\%$, $SD = 24\%$). Over 90% of participants agreed or strongly agreed that hearing aids are an effective rehabilitation tool for older patients [Q6]. The majority of participants (86%) also agreed that the benefits of hearing aids outweigh potential negatives [Q26], and 96% agreed that they have a lot to offer older patients [Q27]. Many practitioners (64%) also reported that their older patients generally achieve good outcomes with hearing aids [Q17], and 67% disagreed that older patients would receive minimal benefits [Q 24]. Practitioners were equivocal about whether older patients only need to wear hearing aids in specific circumstances [Q16].

However, participants were less confident about the benefits of cochlear implants [Q22], with only 25% agreeing that they had potential benefit for older adults. In many cases participants also verbally sought clarification from the researcher whether implants were in fact appropriate/useful for adult clients following the completion of the questionnaire.

Perceived Barriers. Over three-quarters of medical practitioners believed that older patients had difficulty adjusting to using hearing aids [Q8] and that cost was a significant barrier for patients considering aids [Q14].

A number of questions focused on the concept of perceived stigma associated with hearing loss and hearing aid use. Participants showed a tendency (61%) to believe that patients were concerned about the appearance of hearing aids (and associated stigma being seen wearing them) [Q10], while 53% of participants believed that older patients prefer to hide/deny any hearing impairment [Q15]. In contrast, only 27% of participants agreed that it was a disadvantage that hearing aids make loss so visible [Q21].

In contrast to their own perceptions about the priority of patients' hearing, only 35% of practitioners agreed that their patients viewed hearing as a high priority in relation to other health matters [Q20].

Perceived Self Efficacy. In general, medical practitioners reported feeling comfortable discussing and referring patients for hearing rehabilitation. Many (65%) agreed that they found it easy to refer patients to rehabilitative services [Q23] and 61% reported feeling comfortable discussing hearing rehabilitation with patients

[Q18]. However, while many practitioners (40%) agreed that patients generally took advice [Q19], a total of 41% gave a neutral response to this item.

REFERRAL EXPERIENCES

In general, responses to these items were brief making it impractical to undertake a detailed analysis of recurring themes. However, a number of responses to these questions reflected those given to the outcome expectations items on the questionnaire. When asked about perceived barriers to hearing rehabilitation [Q30], 35 participants' responses related to feelings of stigma or reluctance to acknowledge hearing impairment and 17 made reference to the lower priority of hearing in comparison to other health complaints. Furthermore, when asked about the circumstances that led to hearing rehabilitation discussion with patients [Q29], patient initiated or family/spouse initiated queries were more commonly reported (41, 38 participants respectively) than practitioner-directed conversations (33).

Discussion

This study used the HBM to examine factors which may influence medical practitioners' decisions to refer older adults for hearing rehabilitation. An analysis of the perceived threat and outcome expectations held by practitioners provide opportunities to identify ways to more effectively support practitioners and their older patients through the hearing rehabilitation process.

PERCEIVED THREAT

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Perceived threat refers to susceptibility and severity beliefs held by practitioners that may motivate referral of older patients for hearing rehabilitation. Overall, practitioners showed good awareness of the rate of hearing loss in their older patients.

Prevalence figures for hearing loss in older adults vary across studies and depend on the criteria used to define 'loss'. For example, Sindhukar et al (2001) reported that 39% of 2,015 people aged 55 to 99 years had a hearing loss, defined as a pure-tone average at 500 to 4000 Hz of > 25 dB HTL in the better ear. In contrast, Dalton et al (2003) tested 2,688 people aged 53 to 97 years and reported a prevalence rate of 50% using a pure tone average of > 25 dB HTL in the worse ear. Thus, the mean prevalence figure identified by the medical practitioners (46%) is within the range of reported prevalence figures for the older population.

Medical practitioners also showed an understanding of severity of hearing loss, in relation to its potential to negatively impact relationships and patients' independence. Although the majority also reported that they viewed hearing as a high priority for their older patients, 60% of participants agreed that hearing loss was a normal part of ageing not requiring treatment. This suggests that although practitioners view hearing loss as a serious concern for older adults, they may fail to view it as serious enough to warrant intervention in many cases.

Practitioners' perception of the threat posed to older adults from hearing loss is, on the whole, likely to motivate rehabilitation discussions and referral. However, a potential area for further education may be beliefs regarding the inevitability of hearing loss in older adults.

OUTCOME EXPECTATIONS

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Outcome expectations refer to the beliefs about the benefits of, and barriers to hearing rehabilitation for older adults, along with self efficacy beliefs associated with the referral process.

Practitioners' average estimate of the proportion of older patients likely to benefit from hearing rehabilitation was 31%, whereas they reported that only 21% on average actually sought help. These low help-seeking estimates show an awareness of many older adults' disinclination to seek out rehabilitation, and are in keeping with similar recent reports (Schneider, Gopinath et al, 2010). This also shows that practitioners acknowledge that more older adults (10% more on average) stand to benefit from hearing rehabilitation than the number who are currently seeking help.

Of further concern, is that participants estimated that only 31% of individuals would benefit from hearing rehabilitation despite also estimating hearing impairment prevalence at 46%. It appears that many participants believe that hearing rehabilitation is not beneficial for all older adults with hearing loss, a belief that is reflected in response to other related items. Although medical practitioners generally held positive beliefs about the benefits of hearing aids, over 40% believed that many older patients only needed to wear hearing aids for specific activities. In addition, three quarters of practitioners were either unsure or not aware of the potential benefits of cochlear implants for older patients¹. This is despite the fact that the rate of adult cochlear implantation in the participant's own country far exceeds childhood

¹ Although not formally investigated within the study, a number of participants' comments provided directly to the researcher, suggested that many practitioners viewed CI as only of potential benefit to younger people, specifically children.
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implantation (Access Economics, 2006). In 2009 adults aged over 60 years accounted for just over half of all cochlear implant recipients in Australia (Bray, 2009), yet many participants were unsure of their benefit for this age group.

It appears then, that practitioners believe that, at least for a proportion of patients with hearing loss, the benefits of hearing rehabilitation are limited. Such beliefs are contrary to evidence about the positive benefits of hearing rehabilitation for older adults (see Chisolm et al, 2007; Laplante-Lévesque et al, 2010; Sprinzl & Riechelmann, 2010 for reviews) and are likely to decrease practitioners' motivation to refer.

Practitioners' responses to barrier items provided some insight into the reasons why they may believe hearing rehabilitation is sometimes of limited benefit to older adults. Although participants did not report the visibility of a hearing aid as being a serious concern, they showed some concern about the perceived stigma older adults associated with hearing aids. Practitioners also showed concern about their older patients' abilities to adjust to hearing aids and the perceived cost of rehabilitation. These beliefs are likely to negatively impact on practitioners' decisions to refer, especially for those patients whose loss may be viewed by practitioners as relatively "mild", or whom are perceived as not viewing hearing as of particular importance themselves. These results suggest that there is a need to raise awareness with both medical practitioners and patients about the positive benefits of hearing rehabilitation for many older people and about the serious negative consequences of untreated hearing loss (e.g., depression, social isolation).

Promotional materials encouraging patients and practitioners to engage in discussion about hearing rehabilitation have the potential to overcome possible barriers for referral seen here. Increasing conversations about hearing will assist in informing patients that their practitioner views the issue as a priority while also allowing practitioners the opportunity to accurately gauge patients' actual beliefs about hearing rehabilitation. Such an activity is likely not only to increase practitioners' referrals, but also patients' uptake of such advice.

A recent study found that despite 35% of patients (who were aware of their loss) seeking help directly from their GP, only 6.4% of help seekers reported receiving it (Schneider, Gopinath et al, 2010). However, participants in this study reported that they generally find hearing rehabilitation an easy topic to initiate with their patients. Referral then, is unlikely to be limited by a lack of self efficacy on the part of practitioners. Rather, practitioners's concerns about other potential barriers may be responsible for creating an impediment for referral.

Limitations and Recommendations

The lack of comprehensive responses to open ended questions about referral experiences limited opportunities to compare these to responses on the HBM construct items in detail. Furthermore, the referral focus of the current study on practitioners attending a professional development conference meant that the survey instrument was necessarily brief in order to facilitate completion and return, limiting the amount of detail covered by questionnaire items. For example, It should be noted that participants were not asked directly to explain their understanding of the term "hearing rehabilitation". However, responses to qualitative questions generally

focused on hearing aids, suggesting that for many participants, hearing rehabilitation was most likely interpreted as relating only to these devices. Further investigation about this and practitioners' beliefs with respect to the potential benefits of other hearing rehabilitation may be beneficial.

The sample size for this study was limited by the number of practitioners who consented to participate during the annual medical practitioner conferences, where it is likely that the lack of competing work demands between workshops assisted with recruitment. Participants were approached throughout the conference venue, and not just on approach to a hearing-related exhibit in an attempt to recruit a representative sample. However it is likely that the sample does contain some self-selecting bias (due to the voluntary nature of completing and returning the questionnaires distributed) and that the participants may represent practitioners who are motivated towards hearing and or research activities. Subsequent attempts to recruit more participants (e.g., via email and online questionnaires) within practice settings and via professional newsletters was not successful, possibly due to the high level of competing demands on practitioners' time. Further studies may benefit from a greater emphasis on such recruiting methods in order to connect with those practitioners who may initially be less motivated to participate. Although additional participants may add to the results reported here, the study's sample is a good representation of practitioners by gender, age, and region.

Conclusions

The results of the current study provide an overview of factors that may influence practitioners' decisions to refer older adults for hearing rehabilitation. Analysis of

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participant responses to items relating to HBM constructs provides encouraging news that practitioners generally have an accurate perception of the threat to older patients (i.e., prevalence of hearing loss in older adults, consequences for relationships and independence), and the potential for hearing rehabilitation tools to provide some benefit, and they report high levels of self efficacy for referral. However, a significant concern for referral is practitioners' lack of conviction about benefits of hearing rehabilitation for older adults.

Whether this attitude results from a lack of information or education about hearing rehabilitation or from other factors is unclear. However, as these beliefs have the potential to significantly influence patients' attitudes to hearing rehabilitation, further investigation into the origins of such beliefs is warranted in order to better inform and educate as appropriate.

It is reasonable to expect that practitioners will pay less attention to hearing losses that they perceive to be (currently) exerting minimal or no impact over patients functioning. However, raising practitioners' (and patients') awareness of losses that may be going unnoticed could be helpful as a way of anticipating potential subsequent declines in a way that supports patients to take up rehabilitative options as necessary. Educating practitioners and older patients about the potential negative effects of untreated hearing loss, and promoting regular hearing assessments are likely to be beneficial in improving early detection and effective rehabilitation.

Furthermore, complementing hearing screenings with assessments of patients' own perceptions of their impairment in relation to activity limitation and participation restrictions in their everyday lives is recommended (Yueh, 2010). By gaining a better picture of patients' hearing and their associated concerns, practitioners may

be better placed to appropriately and successfully refer older adults for hearing
rehabilitation.

References

- Access Economics. 2006. Listen Hear!: The economic impact and cost of hearing loss in Australia.
- Arlinger S. 2003. Negative consequences of uncorrected hearing loss -a review. *Int J Audiol*, 42, 17-20.
- Bray M. 2009. Cochlear Implant outcomes and experiences of a large elderly population and their communication partners *XIX World Congress of Oto-Rhino-Laryngology*. Brazil.
- Booth M, Bauman A, Owen N, Gore C. Physical activity preferences and sources of assistance, and perceived barriers to increase activity among physically inactive Australians. *Preventive Medicine* 1997; 26: 131-137.
- Brooks D.N., Hallam R.S. & Mellor P.A. 2001. *The effects on significant others of providing a hearing aid to the hearing-impaired partner*. London, ROYAUME-UNI: Whurr.
- Chia E.-M., Wang J.J., Rochtchina E., Cumming R.R., Newall P., et al. 2007. Hearing Impairment and Health-Related Quality of Life: The Blue Mountains Hearing Study. *Ear Hear*, 28, 187-195.
- Chisolm T.H., Johnson C.E., Danhauer J.L., Portz L.J.P., Abrams H.B., et al. 2007. A Systematic Review of Health-Related Quality of Life and Hearing Aids: Final Report of the American Academy of Audiology Task Force on the Health-Related Quality of Life Benefits of Amplification in Adults. *J Am Acad Audiol*, 18, 151-183.
- Cox R.M., Alexander G.C. & Gray G.A. 2005. Who wants a hearing aid? Personality profiles of hearing aid seekers. *Ear Hear*, 26, 12-26.
- Gilliver, M., & Hickson, L. (2011). Medical practitioners' attitudes to hearing rehabilitation for older adults. *International Journal of Audiology*, 50(12), 850–856.

- Cruickshanks K.J., Wiley T.L., Tweed T.S., Klein B.E.K., Klein R., et al. 1998. Prevalence of Hearing Loss in Older Adults in Beaver Dam, Wisconsin: The Epidemiology of Hearing Loss Study. *Am J Epidemiol*, 148, 879-886.
- Dalton D.S., Cruickshanks K.J., Klein B.E.K., Klein R., Wiley T.L., et al. 2003. The Impact of Hearing Loss on Quality of Life in Older Adults. *Gerontologist*, 43, 661-668.
- Davis A., Smith P., Ferguson M., Stephens D. & Gianopoulos I. 2007. Acceptability, benefit and costs of early screening for hearing disability: a study of potential screening tests and models. *Health Technol Assess*, 11, 1-294.
- Davis A.C. 1989. The Prevalence of Hearing Impairment and Reported Hearing Disability among Adults in Great Britain. *Int J Epidemiol*, 18, 911-917.
- Donaldson N., Worrall L. & Hickson L. 2004. Older people with hearing impairment: A literature review of the spouse's perspective. *The Australian and New Zealand Journal of Audiology*, 26, 30-39.
- Horne M., Skelton D., Speed S. & Todd C. 2010. The influence of primary health care professionals in encouraging exercise and physical activity uptake among White and South Asian older adults: Experiences of young older adults. *Patient Educ Couns*, 78, 97-103.
- Kerse NM, Flicker L, Jolley D, Arroll B, Young D. Improving the health behaviours of elderly people: randomised controlled trial of a general practice education programme. *British Medical Journal*. 1999;319:683-7.
- Laplante-Lévesque A., Hickson L. & Worrall L. 2010. Rehabilitation of Older Adults With Hearing Impairment: A Critical Review. *J Aging Health*, 22, 143-153.
- Gilliver, M., & Hickson, L. (2011). Medical practitioners' attitudes to hearing rehabilitation for older adults. *International Journal of Audiology*, 50(12), 850–856.

- Marteau T.M. & Johnston M. 1990. Health professionals: A source of variance in health outcomes. *Psychology & Health*, 5, 47 - 58.
- Raupach J., Rogers W., Magarey A., Lyons G. & Kalucy L. 2001. Advancing Health Promotion in Australian General Practice. *Health Educ Behav*, 28, pp. 352-367.
- Rosenstock I.M., Strecher V.J. & Becker M.H. 1988. Social Learning Theory and the Health Belief Model *Health Educ Behav*, 15, 175-183.
- Scarinci N., Worrall L. & Hickson L. 2008. The effect of hearing impairment in older people on the spouse. *Int J Audiol*, 47, 141-151.
- Schneider J.M., Gopinath B., McMahon C., M., Britt H.C., Harrison C.M., et al. 2010. Role of general practitioners in managing age-related hearing loss. *MJA*, 192.
- Sindhusake, D., Mitchell, P., Smith, W., Golding, M., Newall, P., Hartley, D., et al. (2001). Validation of self-reported hearing loss. The Blue Mountains Hearing Study. *International Journal of Epidemiology*, 30, 1371-1378.
- Sims J., Kerse N.M., L Naccarella L. & Long H. 2000. Health promotion and older people: the role of the general practitioner in Australia in promoting healthy ageing. *Aust NZ J Public Health*, 24, 356-359.
- Sprinzl G.M. & Riechelmann H. 2010. Current Trends in Treating Hearing Loss in Elderly People: A Review of the Technology and Treatment Options - A Mini-Review. *Geronotology*, 56, 351-358.
- Stark P. & Hickson L. 2004. Outcomes of hearing aid fitting for older people with hearing impairment and significant others. *Int J Audiol*, 43, 390-398.
- Uchida Y., Nakashima T., Ando F., Niino N. & Shimokata H. 2003. Prevalence of Self-perceived Auditory Problems and their Relation to Audiometric
- Gilliver, M., & Hickson, L. (2011). Medical practitioners' attitudes to hearing rehabilitation for older adults. *International Journal of Audiology*, 50(12), 850–856.

Thresholds in a Middle-aged to Elderly Population. *Acta oto-laryngologica*,
123, 618-626.

van den Brink R.H., Wit H.P., Kempen G.I. & van Heuvelen M.J. 1996. Attitude and
help-seeking for hearing impairment. *Br J Audiol*, 30, 313-324.

Wallhagen M.I. & Pettengill E. 2008. Hearing impairment: significant but
underassessed in primary care settings. *J Gerontol Nurs*, 34, 36-42.

Wilson D.H., Walsh P.G., Sanchez L., Davis A., Taylor A.W., et al. 1999. The
epidemiology of hearing impairment in an Australian population. *Int J
Epidemiol*, 28, 247-252.

Yueh B., Collins, M. P., Souza, P. E., Boyko, E. J., Loovis, C. F., Heagerty, P. J., et
al 2010. Long-term effectiveness of screening for hearing loss: The screening
for auditory impairment - Which hearing assessment test (SAI-WHAT)
randomized trial. *J Am Geriatr Soc*, 58, 427-434.

Table 1. Perceived threat items and response percentage break-downs (n=104).
 Response Options: SD= Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA= Strongly Agree

Perceived Threat Item	Response Items %				
	SD	D	N	A	SA
SUSCEPTIBILITY					
[Q11] <i>Almost all of my older patients have hearing difficulties</i>	1	20	36	37	6
[Q25] <i>Everyone gets hearing loss as they get older</i>	2	32	25	36	5
SEVERITY					
[Q5] <i>My older patients' hearing is a high priority for me in relation to their overall health</i>	0	5	15	57	23
[Q7] <i>Hearing loss often causes difficulties for older patients' relationships with their spouse and family</i>	0	0	2	38	61
[Q12] <i>Hearing deteriorates with age, and does not always require amplification</i>	1	17	21	54	6
[Q13] <i>Hearing loss in older patients can seriously impair independence</i>	0	1	6	49	44

Table 2. Outcome expectation items and response percentage break-downs (n=104). Response Options: SD= Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA= Strongly Agree.

Outcome Expectation Item	Response Items %				
	SD	D	N	A	SA
BENEFITS					
[Q6] Hearing aids are an effective rehabilitation tool for older patients					
	0	2	6	65	27
[Q16] Many older patients only need to wear their hearing aids for specific activities/circumstances					
	3	27	28	35	6
[Q17] In general, my older patients achieve good outcomes with hearing aids					
	0	9	27	62	2
[Q22] Cochlear implants are of potential benefit to older patients with hearing loss					
	7	19	50	22	3
[Q24] For many older patients, poor hearing is the result of increasing age and they would receive minimal benefit from amplification					
	10	57	24	8	2
[Q26] For older people, the benefits of hearing aids often outweigh the potential disadvantages					
	1	5	9	70	16
[Q27] Hearing aids have a lot to offer older patients with hearing loss					
	0	0	5	71	25
BARRIERS					
[Q8] Many older patients find it difficult to adjust to using hearing aids					
	1	6	17	45	31
[Q10] Older patients are concerned about the appearance					
	1	7	31	41	20

of hearing aids (and the associated stigma of being seen wearing them)

[Q14] *Cost is a significant barrier for older patients when considering hearing aids*

0	12	11	47	31
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[Q15] *Older patients would prefer to hide/deny any hearing impairment*

0	11	36	46	7
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[Q20] *I think older patients consider hearing to be a high priority in relation to their general health*

2	26	37	32	3
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[Q21] *It is a disadvantage for older patients that hearing aids make their hearing loss so obvious to other people*

4	34	34	25	2
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SELF EFFICACY

[Q18] *I find it easy to discuss hearing rehabilitation and assessment with older patients*

1	15	23	50	11
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[Q19] *Older patients will generally take/follow up the hearing rehabilitation advice given to them*

0	17	41	40	2
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[Q23]. *It is easy/straightforward to refer older patients for hearing assessment/rehabilitation*

3	18	14	57	8
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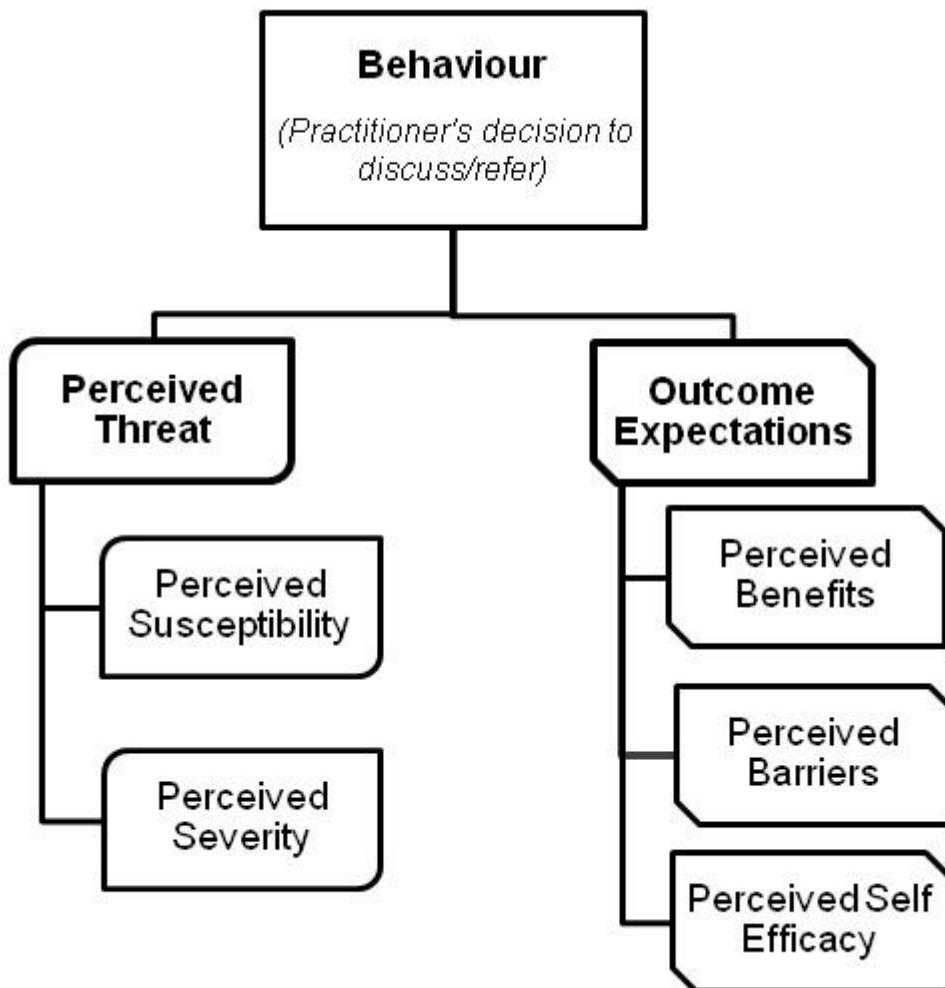


Figure 1

Figure Caption

Figure 1 Components of the Health Belief Model