

Perspectives on hearing aid cost and uptake for prescription and over-the-counter hearing aid users

Megan Knoetze^{1,2}, Vinaya Manchaiah^{1,2,3,4,5}, Ilze Oosthuizen^{1,2}, Eldre Beukes^{2,6} and De Wet Swanepoel^{1,2,3,7}

¹Department of Speech-language Pathology and Audiology, University of Pretoria, Pretoria, South Africa

²Virtual Hearing Lab, Collaborative initiative between University of Colorado School of Medicine, Aurora, Colorado, USA, and University of Pretoria, Pretoria, South Africa

³Department of Otolaryngology-Head and Neck Surgery, University of Colorado School of Medicine, Aurora, Colorado, USA

⁴UCHealth Hearing and Balance, University of Colorado Hospital, Aurora, Colorado, USA

⁵Department of Speech and Hearing, School of Allied Health Sciences, Manipal Academy of Higher Education, Manipal, India

⁶Vision and Hearing Sciences Research Group, Anglia Ruskin University, Cambridge, Cambridgeshire, UK

⁷Ear Science Institute Australia, Subiaco, Australia

All correspondence should be addressed to: De Wet Swanepoel, Room 3-5, Department of Speech-Language Pathology and Audiology, University of Pretoria, Lynnwood Road & Roper Street, Pretoria, South Africa. Tel: +27 (0)12 420 4280. Email: dewet.swanepoel@up.ac.za

CONFLICT OF INTEREST

Author DS is a co-founder, consultant, and scientific advisor for the hearX group, which owns Lexie Hearing, while Author VM is also a scientific advisor for the hearX group. Authors MK, IO and EB have no conflict of interest.

ABSTRACT

Purpose

This study explored user perspectives on the relationship between hearing aid cost and uptake, as well as cost-related recommendations for others with hearing difficulties, in a sample of prescription and over-the-counter (OTC) hearing aid users.

Method

A secondary analysis was conducted on a cross-sectional survey using qualitative content analysis to analyze responses related to the cost of hearing aids. The study included a total of 241 adult participants, comprising 179 prescription hearing aid users from the Hearing Tracker website and 62 OTC hearing aid users from the Lexie Hearing US database.

Results

Prescription users had a mean age of 66.7 years (SD 13.2), including 62.0% males, 37.4% females, and 0.6% non-binary individuals. OTC users had a mean age of 63.0 (SD 13.4), with 48.4% males and 51.6% females. Three overarching domains were identified: perceived enablers to hearing aid uptake related to the cost, perceived barriers to hearing aid uptake related to the cost, and recommendations to others with hearing difficulties related to the cost, with 14 categories recognized for prescription users and 12 for OTC users. Both groups identified the high cost of hearing aids and lack of insurance coverage as significant barriers to uptake. Many prescription users reported external support (e.g., financial support and health insurance coverage) as an enabler, while OTC users frequently mentioned the affordability of OTC devices. The most common recommendation among prescription users was to seek professional support, whereas OTC users recommended researching hearing aids before making a purchase.

Conclusions

Cost and insurance coverage consistently emerge as primary barriers to hearing aid adoption for both prescription and OTC users. To foster greater accessibility, initiatives should target these financial obstacles. Additional research is warranted on the relationship between hearing aid cost and uptake, especially among OTC users and those seeking financial assistance.

KEYWORDS

Hearing loss, Hearing aids, Hearing aid uptake, Cost, Affordability

INTRODUCTION

Hearing loss is widespread, affecting nearly 20% of the global population (World Health Organization, 2021). Hearing aids are the most common management option for hearing loss (Brodie et al., 2018). While hearing aids can improve the listening ability and quality of life of those with hearing loss (Ferguson et al., 2017), only a small proportion of adults with acquired hearing loss seek help for their hearing difficulties and obtain hearing aids globally (Bisgaard et al., 2021). According to the most recent (2011-12, 2015-16, 2017-20) National Health and Nutrition Examination Survey (NHANES) in the United States (US), 85% of persons with audiometric or self-reported hearing loss never tried hearing aids or were not current hearing aids users (Humes, 2023). This underscores the need for a deeper understanding of factors influencing hearing aid uptake.

The average cost of prescription hearing aids in the US is \$5,000 a pair, which is usually an out-of-pocket expense since most health insurance plans do not cover hearing aids (Jilla et

al., 2020). This cost is a bundled price, covering the physical devices, services and support, such as fittings, adjustments and follow-up appointments. However, some audiologists may opt for unbundling, where services are priced separately from the devices. The data from the 2016 American Community Survey showed that three out of four Americans with functional hearing loss could not afford hearing aids at this price (Jilla et al., 2020). Furthermore, purchasing hearing aids at this price would add 4% of the US population into poverty for the year (Jilla et al., 2020). In addition, a study by Mahmoudi et al. (2018) found significantly higher total annual healthcare and out-of-pocket spending by hearing aid users in the US compared to non-users. Our recent systematic review has also demonstrated that having access to financial support positively affects hearing aid uptake in several studies (Knoetze et al., 2023b). Moreover, the MarkeTrack 2022 consumer survey showed that higher income levels and third-party coverage were related to increased hearing aid uptake (Windmill, 2022). The survey also found that increased third-party coverage was a bigger motivator for hearing aid uptake than simply lowered costs (Windmill, 2022). Overall, these studies highlight the high cost of hearing aids as one of the important contributing factors to the low uptake of hearing aids.

Recent changes in regulatory standards for hearing aids in the US may contribute to reducing the affordability barrier. On the 17th of October 2022, the Food and Drug Administration (FDA) issued a final rule, which now enables adults with self-perceived mild-to-moderate hearing difficulties to purchase over-the-counter (OTC) hearing aids online or from stores without a hearing assessment, hearing aid prescription or fitting adjustment by a licensed hearing healthcare professional (Food and Drug Administration, 2022). A few recent studies have demonstrated that OTC hearing aids could provide benefit and satisfaction that are

comparable to prescription hearing aids that are fitted in person by hearing healthcare professionals (Swanepoel et al., 2023; De Sousa et al., 2023). While the price of OTC hearing aids is generally lower than prescription hearing aids, ranging from \$200 to over \$2,000 per pair, the more expensive OTC devices may still be a significant expense for some individuals (Manchaiah et al., 2023).

Our systematic review indicated that while some studies suggest that the high cost of prescription hearing aids may prevent people from obtaining them, there is still limited evidence regarding this matter (Knoetze et al., 2023b). This may be attributed to a scarcity of research specifically exploring the direct impact of cost on hearing aid uptake, with existing studies typically encompassing multiple factors and methodologies rather than solely examining the relationship between cost and hearing aid adoption. Moreover, there are few qualitative studies on this topic. Qualitative research can provide valuable insights into complex issues by capturing the diverse experiences and perspectives of individuals (Austin & Sutton, 2014).

Previous qualitative studies (Chandra & Searchfield, 2016; Ekberg et al., 2017; Heselton et al., 2022; Laplante-Lévesque et al., 2010; McKee et al., 2019) suggest that the high cost associated with hearing aids poses a significant barrier to their uptake, while the perceived benefit of lower costs associated with alternative service delivery models, such as online hearing aids, presents a potential solution to this barrier. These qualitative studies examining the relationship between hearing aid cost and uptake have focused solely on prescription hearing aids primarily due to the timeframe of the research. However, with the recent FDA approval of OTC hearing aids, there is a gap in evidence regarding user perspectives from the OTC

service-delivery model on this topic. Additionally, studies on the relationship between the cost and uptake of OTC hearing aids compared to prescription hearing aids are also important areas of exploration. This may help to inform policies and regulations surrounding hearing aids and may allow for greater accessibility to hearing aids. Therefore, the study explored user perspectives on the relationship between hearing aid cost and uptake, as well as cost-related recommendations for others with hearing difficulties, in a sample of prescription and over-the-counter (OTC) hearing aid users.

METHOD

Ethical approval for this study was obtained from Lamar University's Human Subjects Review Board (Ref: IRB-FY21-248) and from the Faculty of Humanities Research Ethics Committee, University of Pretoria (Ref: HUM008/0822).

Study Design

This preliminary study was based on a secondary analysis of a cross-sectional survey (Knoetze et al., 2023a). Secondary analysis and reuse of qualitative data have become more common in research, allowing for further exploration beyond the original study's scope (Bishop & Kuula-Luumi, 2017; Denzin & Lincoln, 2011). The original study analyzed 642 responses to an open-ended question in an online questionnaire to explore user perspectives on reasons for hearing aid uptake and recommendations to others with hearing difficulties using qualitative content analysis.

A multidisciplinary team consisting of audiologists (authors DS and VM) and social psychologists (Jamie Pennebaker and Ryan Boyd) collaborated to formulate the open-ended

question by incorporating relevant information to encourage users to provide comprehensive responses regarding the primary factors influencing hearing aid uptake and recommendations to others with hearing difficulties. However, for the current study, only the descriptions related to cost were analyzed, considering that numerous participants in the original study mentioned cost-related factors in their responses. The open-ended question was phrased as follows:

For many people, getting and wearing a hearing aid is a major life decision. They often say that getting a hearing aid is embarrassing and makes them feel or look old. Others worry about the cost or what others will say. How did you deal with these issues when you decided to buy a hearing aid? What motivated you to get hearing aids? Was there a single reason or event that convinced you or were there many reasons? Please provide as much detail as possible about the reason(s) why you decided to get hearing aids. What would you recommend to others who are starting to have hearing problems?

Participants and Data Collection

The participants in the original study were adults (18 years and older) with hearing difficulties who had been or were current hearing aid users. The sample was recruited from the Hearing Tracker website (www.hearingtracker.com) and the Lexie Hearing (www.lexiehearing.com) US database. The Hearing Tracker website is an online platform for consumers to freely share their opinions and experiences regarding hearing aids (Swanepoel et al., 2023). Participants from the Hearing Tracker community had received conventional face-to-face hearing care services from hearing healthcare professionals, which were obtained either from private clinics, public health centers, or discount warehouses. On the other hand, individuals from

the Lexie Hearing US database had purchased self-fitting, behind-the-ear (BTE), OTC Lexie Lumen hearing aids online, along with the accompanying application (Swanepoel et al., 2023). In October and November 2021, an email invitation containing a link to an online informed consent form and questionnaire was sent to the Hearing Tracker and Lexie Hearing US databases. Informed consent was required before the participants could complete the online questionnaire.

Data Analysis

The original dataset included 642 users, consisting of 415 prescription users and 227 OTC users. The dataset was screened in Microsoft Excel to identify responses to the open-ended question related to hearing aid cost. The researcher carefully reviewed each response manually without relying on specific keyword searches. A total of 241 responses (179/241 responses from prescription hearing aid users and 62/241 responses from OTC hearing aid users) were identified as related to cost and included in the present study. Qualitative content analysis was used systematically to examine and interpret the data to identify patterns, themes, and relationships. Knudsen et al. (2011) described coding and categorization as critical components of qualitative data analysis. Coding involves assigning labels or tags to specific segments of the data, while categorization involves grouping these codes into broader categories. The authors emphasized that the coding and categorization process should be iterative and involve ongoing reflection and revision to ensure that the emerging categories accurately capture the data.

The primary researcher (MK) read the data multiple times to develop an understanding of its content and to identify meaningful units of text. Using an inductive approach (i.e., bottom-

up), the researcher assigned specific codes to the meaning units and organized them into broader categories and domains. This approach is particularly valuable for exploring new or under-researched topics, providing new insights and understandings based on the collected data. The qualitative content analysis involved an iterative process where the researcher constantly revisited and refined the coding and categorization. As the analysis progressed, MK revised codes or created new categories based on emerging patterns in the data. This iterative approach facilitated a nuanced and comprehensive understanding of the data, ensuring the identification of all relevant patterns. To assess the inter-coder reliability, 25% of the coding was randomly cross-checked by other research team members (IO and EB). Any discrepancies were resolved through discussions with the rest of the research team to ensure responses were categorised appropriately by consensus. The result of the inter-coder reliability check showed a high level of agreement among the team members, with a 97% agreement rate. This demonstrates that the coding process was consistent and reliable, and the codes were applied consistently across different team members. We have provided a codebook as supplementary material to ensure transparency in our methodology (see Supplementary Material 1).

RESULTS

The demographic characteristics of participants are shown in Table 1. A total of 241 hearing aid users were included in the study, with 179 being prescription users and 62 being OTC users. The mean age of prescription users was 66.7 years (SD = 13.2), while OTC users had a lower mean age of 63.0 years (SD = 13.4). In terms of gender distribution, the majority of prescription users were male (62.0%), while the majority of OTC users were female (51.6%). Only one participant in the study identified as non-binary. When asked about self-reported

hearing difficulty (i.e., hear everything, sometimes don't hear, regularly don't hear, and almost never hear), most users reported that they regularly don't hear, with 48.0% of prescription users and 56.5% of OTC users falling into this category. The mean duration of hearing difficulties was shorter for OTC users (14.0 years; SD 13.5) compared to prescription users (22.4 years; SD 16.6). However, the mean duration before purchasing a hearing aid was relatively similar for both groups, with prescription users waiting 8.1 years SD 12.1 and OTC users waiting 7.9 years SD 9.8 before purchasing hearing aids. Most prescription users (56.4%) purchased their hearing aids from hearing aid clinics or universities.

Table 1. Demographic characteristics of hearing aid users

Characteristic	Prescription users (n = 179)	OTC users (n = 62)	Total users (n = 241)
Age (mean; SD)	66.7 (13.2)	63.0 (13.4)	65.8 (13.3)
Gender (n; %)			
Male	111.0 (62.0%)	30.0 (48.4%)	141.0 (58.5%)
Female	67.0 (37.4%)	32.0 (51.6%)	99.0 (41.1%)
Non-binary	1.0 (0.6%)	-	1.0 (0.4%)
Self-reported hearing difficulty (n; %)			
Hear everything	-	1.0 (1.6%)	1.0 (0.4%)
Sometimes don't hear	47.0 (26.3%)	19.0 (30.6%)	66.0 (27.4%)
Regularly don't hear	86.0 (48%)	35.0 (56.5%)	121.0 (50.2%)
Almost never hear	46.0 (25.7%)	7.0 (11.3%)	53.0 (22.0%)
Duration of hearing difficulties in years (mean; SD)	22.4 (16.6)	14.0 (13.5)	20.2 (16.3)
Duration before hearing aid purchase in years (mean; SD)	8.1 (12.1)	7.9 (9.8)	8.0 (11.6)
Hearing aid purchase (n; %)			
Hearing aid clinic or university	101 (56.4%)	-	-
Discount warehouse (e.g., Costco, Sam's Club)	36 (20.1%)	-	-
Internet or online	11 (6.1%)	-	-
Pharmacy hearing center	2 (1.1%)	-	-
Other	29 (16.2%)	-	-

The qualitative content analysis of hearing aid user perspectives on the relationship between hearing aid cost and hearing aid uptake are shown in Tables 2 and 3. Table 2 provides the domains and categories identified for prescription hearing aid users, and Table 3 provides the domains and categories identified for OTC hearing aid users. Notably, some individuals who used OTC devices had previously used prescription devices and vice versa. Nevertheless, our analysis aimed to differentiate between responses pertaining to prescription and OTC devices when this was clearly apparent from the textual responses. In both groups, three overarching domains were apparent that were related to cost: perceived enablers, perceived barriers, and recommendations, with 14 categories recognized for prescription users and 12 for OTC users.

Prescription Hearing Aid User Perspectives

Domain 1: Perceived Enablers Related to Cost

Perceived enablers included four categories, presented in Table 2 and Figure 1. Several participants reported having the financial ability to afford hearing aids. Therefore, the cost was not a hindrance for them. Some participants described the cost-benefit of hearing aids, as they felt that the benefits of purchasing and using hearing aids outweigh the costs associated with it, e.g., improved hearing, improved quality of life, and increased participation in activities of daily living. Affordable options were mentioned by some participants who either shopped around for the best prices or discovered that hearing aids were more affordable at specific places, e.g., discount warehouses. Many participants reported receiving external support to pay for their hearing aids, e.g., financial assistance from organizations like the Veteran's Affairs or Vocational Rehab, health insurance, or financial support from a family member(s).

Table 2. Prescription hearing aid user perspectives on the relationship between cost and uptake of hearing aids

Domain	Category	n	Meaning unit examples
Perceived enablers	External support	46	<i>The VA paid for my hearing aids (P172, 80 yrs., male)</i>
	Affordable options	42	<i>Shopped for the best value (P32, 70 yrs., male)</i>
	Availability of finances	40	<i>I had enough discretionary income so price wasn't an issue (P116, 71 yrs., female)</i>
	Cost-benefit	29	<i>Yes hearing aids expensive and hard get used to it but the quality of life gets better when you can hear (P228, 49 yrs., male)</i>
Perceived barriers	High cost of HAs in general (i.e., OTC or prescription HAs)	91	<i>Cost was a major reason why I delayed getting hearing aids (P138, 65 yrs., female)</i>
	Not covered by insurance	14	<i>The cost of hearing aids is a MAJOR financial burden and medical insurance does not assist (P300, 47 yrs., female)</i>
	Cost-benefit concern	8	<i>Doesn't matter, have paid thousands over the years and I still can't hear (P207, 65 yrs., female)</i>
	Long-term and ongoing costs	5	<i>Could not afford to replace even one (P386, 73 yrs., female)</i>
Recommendations	Seek professional support	13	<i>Go to a professional audiologist and get tested and get an audiogram to determine your level of hearing loss before you buy (P70, 57 yrs., female)</i>
	Do research before you buy	9	<i>Do a lot of research before you buy (P217, 80 yrs., male)</i>
	Purchase new technology	8	<i>Purchase the most current technology you can afford (P312, 63 yrs., female)</i>
	Avoid OTC or cheaper hearing aids	4	<i>Don't try to diagnose yourself and buy hearing aids online or over the counter – you will most likely waste money (P275, 81 yrs., male)</i>
	Seek financial support	4	<i>My recommendation for others who are starting to have hearing problems are to seek out professional assistance with financing if needed (P300, 47 yrs., female)</i>
	Do a hearing aid trial before you buy	3	<i>Be sure to try first (P92, 76 yrs., male)</i>

OTC = Over-the-counter

Note: This table includes direct quotes from participants, therefore there might be grammatical errors.

Table 3. Over-the-counter hearing aid user perspectives on the relationship between cost and uptake of hearing aids

Domain	Category	n	Meaning unit examples
Perceived enablers	Affordability of OTC HAs	27	<i>I was very happy with the product and it was more affordable than the co-pay my insurance required. (P651, 73 yrs., male)</i>
	Payment plan	4	<i>Having small monthly payments sold me on the deal with Lexie! (P500, 29 yrs., female)</i>
	Cost-benefit	2	<i>They're too expensive but at least with them I can hear (P521, 55 yrs., female)</i>
Perceived barriers	High cost of HAs in general (i.e., OTC or prescription HAs)	25	<i>Could not really afford them (P523, 72 yrs., male)</i>
	Expense of prescription HAs	12	<i>Bought a \$3000.00 set of hearing aids from an audiologist that lasted about two years and quit working. Too expensive to replace (P682, 64 yrs., male)</i>
	Replacement cost of prescription HAs	5	<i>But when I lost one..... the cost to replace it had gone up so much I still couldn't afford to do it (P630, 74 yrs., female)</i>
	Not covered by insurance	3	<i>Getting the hearing aids was not a big issue except for the cost as my insurance does not cover them (P668, 57 yrs., female)</i>
	Cost-benefit concern	3	<i>I was also concerned that I would spend a large amount of money and they would not help me (P487, 41 yrs., female)</i>
Recommendations	Do research before you buy	4	<i>Search for right hearing aids for you, your hearing and your budget (P482, 66 yrs., female)</i>
	Purchase new technology	1	<i>I upgraded them because the technology advanced a lot in a year (P672, 51 yrs., male)</i>
	Avoid cheaper hearing aids	1	<i>First one was cheap crap with poor sound quality (P678, 72 yrs., male)</i>
	Do a hearing aid trial before you buy	1	<i>Execute a free trial and see if aids help (P724, 83 yrs., male)</i>

OTC = Over-the-counter; HA = hearing aid

Note: This table includes direct quotes from participants, therefore there might be grammatical errors.

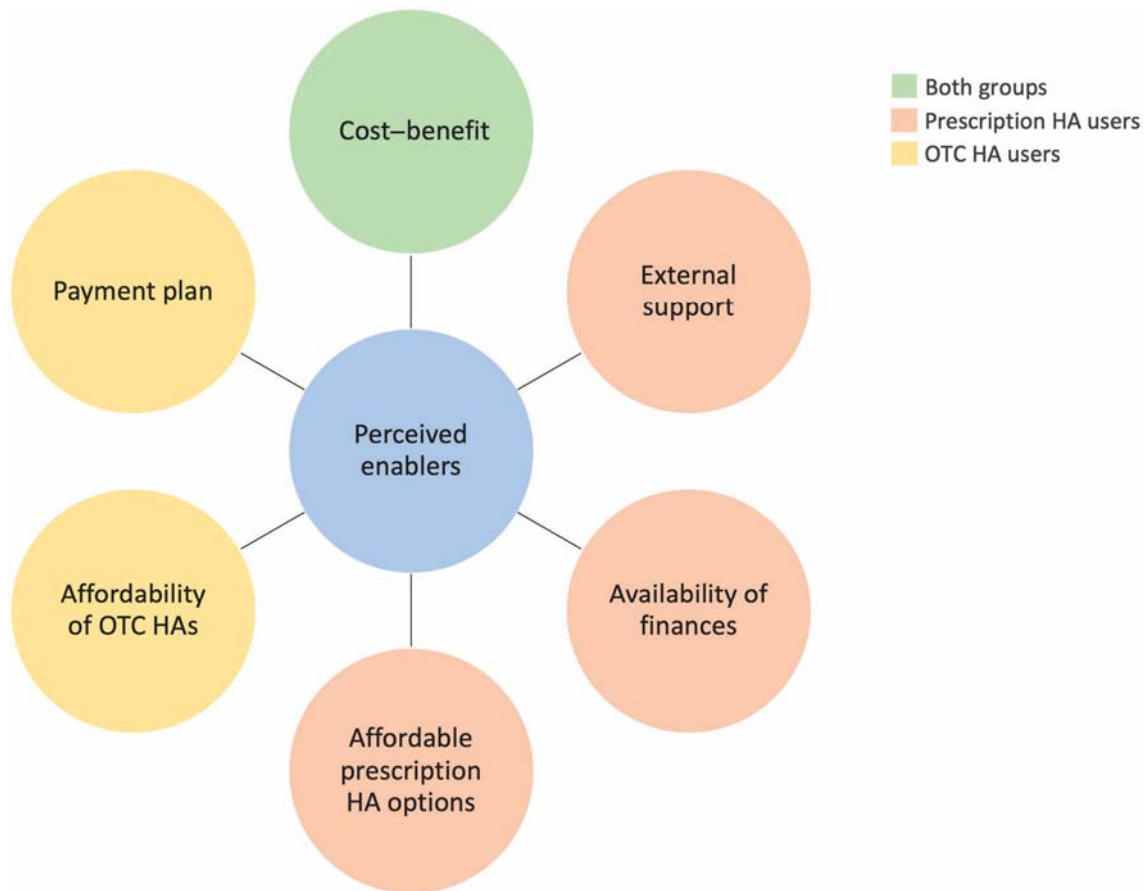


Figure 1. Categories related to cost identified for perceived enablers of hearing aid uptake. HA(s) = hearing aid(s); OTC = over the counter.

Domain 2: Perceived Barriers Related to Cost

Perceived barriers included four categories (see Table 2 and Figure 2). Most participants viewed the high cost of hearing aids as a significant impediment to their uptake, leading to postponed acquisition for some participants. Some participants mentioned the lack of insurance coverage for hearing aids as a financial burden. In the cost-benefit concern category, some participants felt that the cost of hearing aids did not justify their perceived benefits. Despite paying a significant amount to purchase hearing aids, these participants still experienced difficulty hearing, e.g., some still reported difficulty understanding speech in

background noise or listening to music. Long-term and ongoing costs, such as repair and replacement costs, were also mentioned by some participants.

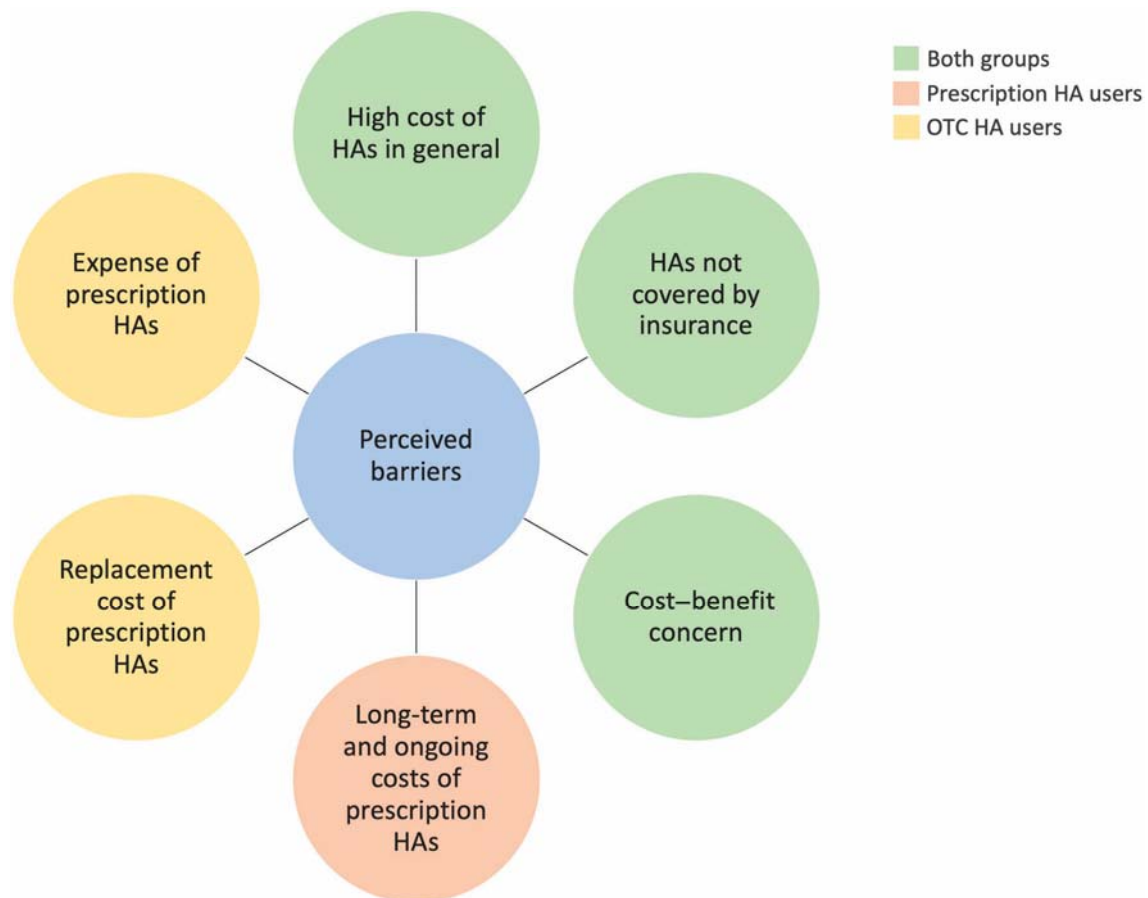


Figure 2. Categories related to cost identified for perceived barriers to hearing aid uptake.

HA(s) = hearing aid(s); OTC = over the counter.

Domain 3: Recommendations Related to Cost

Recommendations included six categories (see Table 2 and Figure 3). Participants recommended the importance of seeking professional support before purchasing hearing aids, e.g., consulting an audiologist and getting a hearing test before purchasing or seeking medical advice from an Ear-Nose-Throat (ENT) specialist. Some participants also suggested

doing research before buying hearing aids, including looking for information online and on hearing aid manufacturer websites.

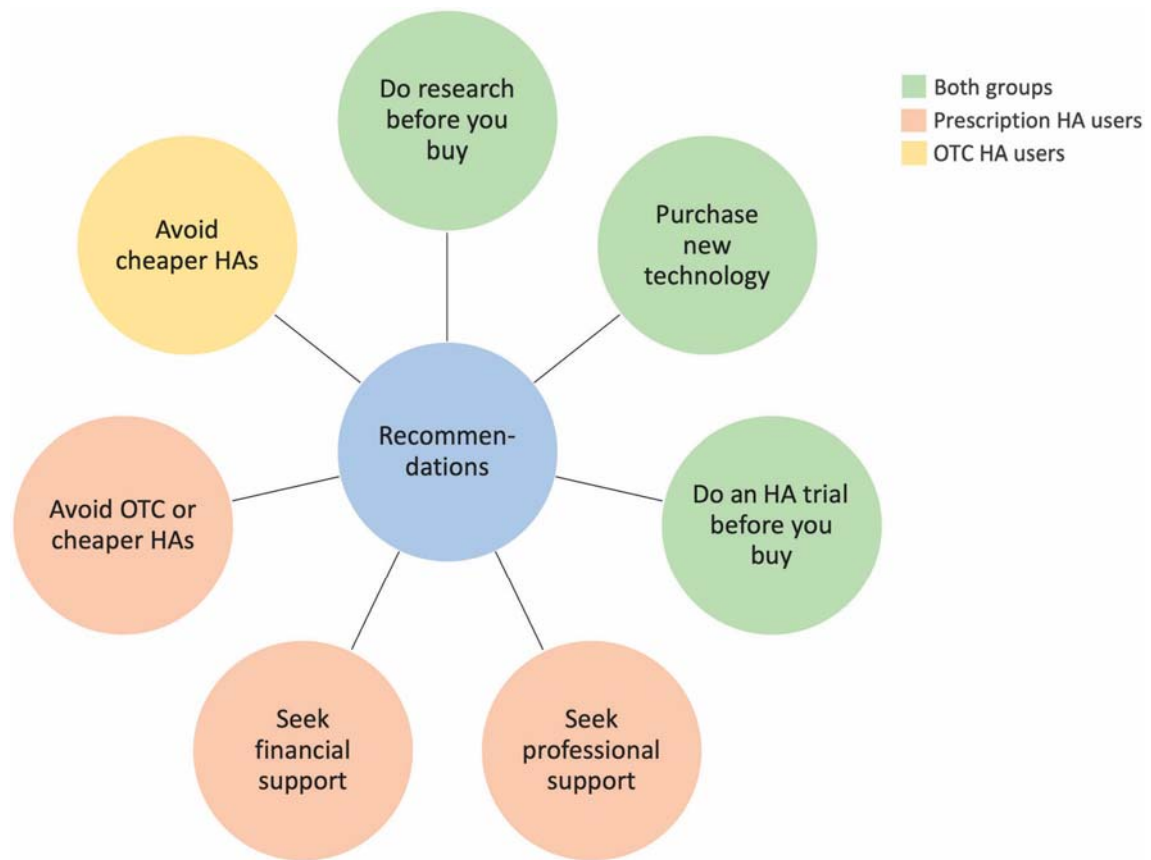


Figure 3. Categories related to cost identified for recommendations to others with hearing difficulties. HA(s) = hearing aid(s); OTC = over the counter.

Another key category was purchasing new technology. Participants suggested that individuals purchase the most current technology they can afford or upgrade their hearing aids when their budget permits. Furthermore, some participants cautioned against purchasing OTC or less expensive hearing aids. A smaller representation also identified seeking financial support as important, suggesting exploring finance or grant funding options. Finally, a number of participants recommended doing a hearing aid trial before making a purchase.

OTC Hearing Aid User Perspectives

Domain 1: Perceived Enablers Related to Cost

Perceived enablers included three categories, presented in Table 3 and Figure 1. In this domain, most participants reported the affordability of OTC devices as a key factor in their decision to purchase hearing aids. A few mentioned the payment plan offered by Lexie Hearing as an enabler. In the cost-benefit category, participants expressed that they generally perceived their hearing aids as providing good value for the money spent, citing perceived benefits from their use.

Domain 2: Perceived Barriers Related to Cost

Perceived barriers included 5 categories, presented in Table 3 and Figure 2. The high cost of hearing aids, in general, was reported as a significant barrier for many participants. In this category, OTC users may have referred to the high cost of OTC or prescription devices. A number of participants specifically mentioned the expense of prescription hearing aids as a barrier, with some indicating that they could not afford to replace their prescription hearing aids when they were lost or damaged and, therefore, they purchased OTC hearing aids. The lack of insurance coverage was also a barrier for some OTC hearing aid users. Lastly, cost-benefit concerns were raised by some participants who felt that the hearing aids did not improve their hearing even though they were very expensive.

Domain 3: Recommendations Related to Cost

Four categories of recommendations (Table 3 and Figure 3) were identified. Some OTC hearing aid users recommended researching before purchasing hearing aids to find the right fit for their hearing and budget. One participant advised upgrading hearing aids with new

technology, while another participant cautioned against cheaper hearing aids due to poor sound quality. Lastly, another participant recommended trying out hearing aids through a free trial to assess their effectiveness.

DISCUSSION

The relationship between hearing aid cost and uptake, as well as cost-related recommendations for others with hearing difficulties, were explored in a sample of 179 prescription and 62 OTC hearing aid users. The results of qualitative content analysis of open-ended responses and practice implications, framed within the context of the Health Belief Model (HBM) proposed by Rosenstock (1966), are discussed below. The HBM provides a valuable perspective for understanding various health behaviors, including the poor uptake of hearing aids (Rosenstock, 1966). The HBM psychological framework proposes that an individual's decision to engage in health-related actions, such as hearing aid uptake, is influenced by perceived factors such as susceptibility, severity, benefits, barriers, self-efficacy, and cues to action (Saunders et al., 2016).

Perceived Enablers Related to Cost

This study identified several perceived enablers related to cost that influence hearing aid uptake. This is in line with the HBM, as these factors facilitate the adoption of hearing aids by addressing barriers, enhancing the perceived benefits, and increasing individuals' confidence in their ability to manage costs and make informed decisions. Most prescription hearing aid users reported that external support, such as financial assistance from organizations, health insurance coverage, or support from family members, played a significant role in facilitating hearing aid uptake. These findings align with previous research indicating that access to

financial support positively affects hearing aid uptake (Jilla et al., 2020; Knoetze et al., 2023b). Therefore, it is essential for stakeholders to focus on making financial assistance programs more widely available and easily accessible to those who require it. However, it is important to recognize that financial assistance or insurance coverage does not guarantee universal adoption. For example, in countries like Norway and the United Kingdom, where hearing aids are fully subsidized by the government, a significant proportion of individuals still do not obtain hearing aids (Kirkwood, 2015).

Partly contributing to this trend is the concept of an inelastic demand function within the hearing aid industry (Amlani, 2023). In other words, as the retail price of hearing aids increases or decreases, there is no significant change in the number of hearing aids sold (Amlani, 2023). For instance, Amlani and De Silva (2005) reported a demand function of $|0.49|$, indicating that even when hearing aids are provided at no cost to the consumer, only 49 out of 100 individuals would adopt hearing aids, while the remaining 51 individuals would choose not to adopt them, despite the absence of financial cost. Hearing aid cost is, therefore, not the only consideration when individuals decide whether to take up hearing aids. In line with the multi-dimensional perspective of the HBM, other factors, such as readiness to change and stigma, should also be taken into account by hearing healthcare professionals when addressing barriers to hearing aid uptake (Knoetze et al., 2023a; Knoetze et al., 2023b).

Many prescription hearing aid users reported having the financial means to afford hearing aids, eliminating cost as a barrier. Some prescription hearing aid users mentioned affordable options as an enabler. This emphasizes the importance of considering individual financial circumstances and the ability to afford hearing aids. Hearing healthcare professionals should

use a shared decision-making approach when discussing the cost options of hearing aids since it has been identified as a difficult-to-discuss topic (Ekberg et al., 2017). To facilitate shared informed decision-making, patients must be provided with clear and comprehensive information on all the available options to allow them to play an active part in the decision-making process (Pryce et al., 2016). Furthermore, offering a range of hearing aids at different price options allows the patient to choose the most suitable option for them and may lead to a smoother interaction between the hearing healthcare professional and the patient (Ekberg et al., 2017). This aligns with the HBM's emphasis on cues to action, where well-informed individuals are more likely to take action when they perceive the benefits outweigh the barriers.

Some participants from both groups emphasized the benefits of hearing aids, such as improved hearing, quality of life, and participation in daily activities, which outweighed the costs associated with purchasing hearing aids. This is in agreement with McMahon et al. (2021), who also found that cost-benefit evaluations influence hearing help-seeking or hearing aid uptake decisions. In another study, Brent (2019) carried out a cost-benefit analysis of hearing aids by converting the Quality Adjusted Life Year (QALY) to a benefit estimate, including the direct benefits as well as indirect benefits related to reducing dementia symptoms, and found that the benefits of hearing aids were very large relative to the costs. Therefore, hearing healthcare professionals should raise awareness regarding the direct and indirect benefits of hearing aids. They can do this by providing educational materials and online resources or incorporating discussions in the initial consultation for prescription users. This could motivate individuals to take up hearing aids, regardless of the associated cost (Knoetze et al., 2023a).

In the case of OTC hearing aid users, the affordability of OTC devices was identified as an important factor enabling them to purchase hearing aids. This suggests that the lower cost of OTC hearing aids relative to prescription hearing aids may contribute to increased uptake of hearing aids for some potential users for whom the cost of hearing aids is a potential barrier to uptake. Some OTC hearing aid users mentioned the availability of payment plans as an enabler for individuals who cannot afford the full cost upfront or lack insurance coverage or external support. Other OTC manufacturers should also consider offering payment plans to make their products more affordable and accessible.

Perceived Barriers Related to Cost

The study's findings regarding perceived barriers related to cost link directly with the HBM's construct of perceived barriers, which can hinder health-related behaviors, such as hearing aid uptake. The high cost of hearing aids was consistently reported by both groups as a significant barrier to uptake, in line with previous research (Jilla et al., 2020; Lin, 2018). OTC hearing aid users reported the high cost of hearing aids in general (which may also refer to the cost of OTC hearing aids), as well as the expense of prescription hearing aids specifically, as barriers to uptake. Lack of insurance coverage exacerbated the financial burden for some prescription hearing aid users, as also reported by McKee et al. (2019) and Jilla et al. (2020). Hearing healthcare professionals can play a role in advocating for improved insurance coverage for hearing aids. Collaborating with insurance providers and policymakers to expand coverage options can help reduce the financial burden on patients. Hearing aid users in both groups expressed concerns about the cost of hearing aids not justifying their perceived benefits, as some still experienced hearing difficulties even after purchasing and using expensive hearing aids. The long-term costs associated with repairs and replacements were

mentioned by prescription hearing aid users. Healthcare professionals and OTC vendors should discuss the long-term costs of hearing aids, such as maintenance, repairs, and replacements. Patients must have a clear understanding of the financial commitment beyond the initial purchase to plan accordingly. Providing maintenance packages or extended warranties as a part of hearing aid sales can also help alleviate long-term cost concerns. A few OTC hearing aid users mentioned affordability issues when it came to replacing or repairing lost or damaged prescription hearing aids, leading them to opt for OTC alternatives. As OTC hearing aids become more prevalent, it is important for hearing healthcare professionals to educate patients about the potential advantages and limitations of OTC devices. This guidance can help individuals make informed decisions regarding their hearing needs and budget constraints. The findings from both prescription and OTC hearing aid users' perspectives underscore the need for interventions that effectively address the cost-related barriers associated with hearing aid uptake, such as exploring options for insurance coverage and promoting affordable hearing aid options.

Recommendations Related to Cost

In addition to Knoetze et al. (2023a), this study's preliminary findings contribute to the limited body of research on hearing aid users' recommendations within the context of cost-related statements. User recommendations provide important information regarding the preferences, needs and experiences of hearing aid users. Both prescription and OTC hearing aid users provided many similar recommendations in this study. Prescription hearing aid users stressed the importance of consulting audiologists or ENT specialists before purchasing hearing aids, highlighting the value of hearing assessment and professional guidance in decision-making. Researching hearing aids was seen as important in making informed choices

by both groups. Participants from both groups recommended considering purchasing the most current technology or upgrading hearing aids when the budget permits, indicating a desire for optimal technology and performance. Recent consumer surveys have shown that hearing aid users tend to purchase the highest level of technology which is more expensive, although many of these users report cost as an issue for hearing aid uptake (Bannon et al., 2022; Manchaiah et al., 2021). Moreover, seeking financial support through various options, such as financial plans or grant funding, was suggested by a few prescription hearing aid users as a means to overcome cost barriers. By emphasizing the importance of consulting professionals, researching options, and seeking financial support, the study underscores the role of the HBM's cues to action and self-efficacy in guiding individuals toward adopting hearing aids. This information may be useful for hearing healthcare professionals, researchers, and policymakers in developing interventions and policies that are more effective, acceptable, and aligned with the expectations of hearing aid users.

Study Limitations

This exploratory study has several limitations, and the results must be viewed in light of these. First, the study's results included a secondary analysis of an open-ended question about why people purchase hearing aids (Knoetze et al., 2023a). It is important to note that the data was not originally intended for this specific research question. Consequently, the depth and specificity of information related to hearing aid costs may be limited and should be viewed as preliminary. Second, the study population consisted of individuals who already obtained hearing devices, potentially introducing selection and response biases. As participants were self-selected through outreach efforts, their perspectives may not fully represent the broader population with hearing loss. Additionally, there is a risk of self-selection in our study

population, recruited from online platforms like Hearing Tracker, as participants likely represent a subset of individuals more engaged in discussing hearing aids. For this reason, caution should be exercised when generalizing the findings. Nevertheless, the study provides valuable insights into the views of those pursuing hearing aids regarding the relationship between cost and uptake. Third, the survey did not include any questions to determine whether participants paid for their hearing aids or received them at no cost. Therefore, a stratified analysis was not possible, and we could not discuss differences in perspectives between those who paid for their hearing aids and those who received them at no cost, including those covered by health insurance. Future research should incorporate questions about the cost participants paid for their hearing aids and their income background to understand the financial aspects of hearing aid uptake for a comprehensive analysis of users' perspectives. Fourth, demographic data, e.g., race, ethnicity and income level, was not collected or available for analysis. This limited our ability to explore how these factors interact with participants' experiences and perspectives on the relationship between hearing aid cost and uptake. Additionally, the demographics of this sample may not reflect the diversity of the population. Finally, only one brand of OTC hearing aid users was included in the study, which is not representative of all OTC hearing aid users. Therefore, further research specifically focused on the relationship between hearing aid cost and uptake, especially among OTC users using different OTC hearing aids, is warranted to advance understanding in this field.

CONCLUSION

This exploratory study makes a notable contribution to the existing literature by providing valuable insights into the perspectives of both prescription and OTC hearing aid users regarding the relationship between cost and uptake. The inclusion of user recommendations

related to cost, often overlooked in previous works, further enriches the understanding of factors influencing hearing aid adoption. The high cost of hearing aids was identified as a significant barrier to uptake by both groups. While external support, such as financial assistance and health insurance coverage, have the potential to facilitate hearing aid uptake in certain individuals, it is important to note that they do not guarantee universal adoption. The lower cost of OTC hearing aids compared to prescription aids was identified as an enabler for uptake. Both groups provided similar recommendations to others with hearing difficulties. However, prescription users recommended seeking professional support, whereas OTC users recommended researching hearing aids before purchasing them. By considering the perspectives and recommendations of hearing aid users, interventions can be developed to address the perceived barriers and enhance the perceived benefits of using hearing aids. This can improve access to hearing aids, aligning with the principles of the HBM to promote health-related behaviors.

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DATA AVAILABILITY STATEMENT

The datasets generated and/or analyzed for the current study are available from the corresponding author upon reasonable request.

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