Reasons for hearing aid uptake in the United States: A qualitative analysis of open-text responses from a large-scale survey of user-perspectives

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ABSTRACT

Objective: This study aimed to explore the main reasons for hearing aid uptake from a user perspective and recommendations to others with hearing difficulties.

Design: A cross-sectional survey design was used. Responses to a single open-ended question were analyzed using qualitative content analysis.

Study sample: Participants (n=642) included adult hearing aid users sampled from the Hearing Tracker website community and Lexie Hearing user databases in the United States.

Results: Participants had a mean age of 65.4 years (13.7 SD) and included 61.8% males, 37.7% females, 0.3% non-binary, and 0.2% preferred not to say. Reasons for hearing aid uptake were categorized into three domains (personal impact, social difficulties, and auditory difficulties), containing 11 main categories and 48 sub-categories. User recommendations to others with hearing difficulties constituted eight main categories (timely help, trial period, support, affordability, technology, direct-to-consumer hearing aids, adjustments, and advocacy) and 32 sub-categories.

Conclusions: The decision to take up hearing aids included intrinsic factors like readiness to change and extrinsic factors such as the availability of finances. The most frequent recommendation to others was not to delay seeking hearing help and to get hearing aids. Our findings may support strategies to facilitate behavior change for improved hearing aid uptake.

KEY WORDS

Hearing loss, Hearing aids, Hearing aid uptake, Hearing help-seeking

INTRODUCTION

More than 1.5 billion people worldwide experience hearing loss, of whom at least 430 million experience disabling hearing loss that will require rehabilitation (World Health Organization, 2021). Due to the growing population, it is estimated that by 2050 over 700 million people will suffer from disabling hearing loss (World Health Organization, 2021). People frequently delay seeking help for their health issues (Cornally & McCarthy, 2011; Doll et al., 2021), especially for hearing problems (Simpson et al., 2019). If not addressed, hearing loss can have severe consequences, including communication difficulties, social isolation and reduced quality of life (Nordvik et al., 2018; Shukla et al., 2020). Moreover, untreated hearing loss is associated with cognitive decline (Lin et al., 2023; Livingston et al., 2020). The Lancet Commission on Dementia Prevention, Intervention, and Care identified unaddressed hearing loss as a potentially modifiable risk factor in mid-life for developing dementia (Livingston et al., 2020). A recent study showed that hearing intervention can reduce cognitive decline by 48% in at-risk older adults over three years (Lin et al., 2023).

The majority of people with hearing loss can benefit from hearing aids (Ferguson et al., 2017). However, hearing aid adoption around the world has been low. In the United States (US), hearing aid ownership among older adults was estimated to be 18.5% in 2018 (Reed et al., 2021). A study by Orji et al. (2020) showed that 83% of people who could benefit from hearing aids are not using them. Similarly, Bisgaard et al. (2021) estimated the global hearing aid coverage using data on hearing aid sales and found that fewer than 11% of people with disabling hearing loss are hearing aid users. The reasons for the poor penetration of hearing aids are multifaceted, as outlined below.

The decision to seek help and take up hearing aids can be influenced by a person's readiness to change (Manchaiah et al., 2017). According to the transtheoretical model, health behavior change involves moving through different stages, including pre-contemplation (unaware or resistant to change), contemplation (considering change), preparation (planning for change), action (actively modifying behavior), maintenance (sustaining new behavior) and termination (fully ingrained change, optional stage) (Prochaska & Velicer, 1997). A study by Laplante-Lévesque et al. (2013) describes how the stages of change can be applied to audiological rehabilitation. Later stages of change indicate a greater likelihood of seeking help and taking up hearing aids (Manchaiah et al., 2017). A study by Schönborn et al. (2020) reported that adults in a later stage of change were more inclined to follow up with a hearing healthcare professional after they failed an app-based digits-in-noise (DIN) hearing screening test. Similarly, Ratanjee-Vanmali et al. (2020) found that patients who continued seeking hearing healthcare (e.g., obtaining hearing aids and support services) were in a later stage of change (action stage) compared to patients who did not seek hearing healthcare. Understanding readiness to change is important for health care professionals to support and inform uptake of hearing aids.

Nevertheless, as highlighted earlier, many factors can influence a person's readiness to take up hearing aids (Jenstad & Moon, 2011; Knudsen et al., 2010; Knoetze, Manchaiah, Mothemela, et al., 2023; Meyer & Hickson, 2012; Ng & Loke, 2015). Self-stigma, for example, has been identified as a barrier that may prevent people with hearing loss from obtaining hearing aids (Wallhagen, 2009). In a qualitative study by Wallhagen (2009), stigma was related to alterations in self-perception, ageism and vanity. Participants reported that the meaning of hearing loss and hearing aids changed the way they perceive themselves and their partners,

as well as how others view them (Wallhagen, 2009). Furthermore, participants reported that hearing aids would make them appear old or unattractive (Wallhagen, 2009). The cost of hearing aids has also been reported as a barrier to hearing aid uptake, even in high-income countries like the US (Fischer et al., 2011). However, it's important to acknowledge that in countries, such as Norway and the United Kingdom, where the government provides free hearing aids, a considerable portion of the population still don't acquire hearing aids (Kirkwood, 2015). Therefore, it is essential to examine the various factors that may be preventing or enabling people to acquire hearing aids, taking into account the complex nature of this issue.

Rolfe and Gardner (2016) recruited 22 adult hearing aid users and conducted semi-structured interviews with thematic analysis to identify barriers to hearing aid uptake. Three themes were identified representing barriers to intervention uptake, including the journey from realization to readiness, combatting social stigma and accessing appropriate services (Rolfe & Gardner, 2016). Zheng et al. (2022) also used semi-structured interviews with thematic analysis to identify barriers to hearing aid uptake in a group of 12 adults who had seen Ear, Nose and Throat (ENT) specialist doctors but did not take up hearing aids. Barriers included a desire for a cure for hearing loss, a lack of perceived need for hearing aids and negative impressions and misconceptions about hearing aids (Zheng et al., 2022). However, a study by Engelund (2006) proposed that the focus should not be on why people do not seek treatment but rather on why people do seek treatment. Engelund (2006) concluded that in order for people to act on their hearing problem, they need to go through four stages of a complex process to recognize their hearing loss, including attracting attention, becoming suspicious, sensing tribulation and jeopardizing fundamental self.

The attracting attention stage refers to when a person with hearing loss does not experience hearing problems, but others who are close to the person start noticing his/her hearing problems. The becoming suspicious stage involves noticing some hearing difficulty. These two stages could explain what happens during the transtheoretical model's pre-contemplation stage. The sensing tribulation stage refers to when a person starts becoming more aware of his/her hearing problems and experiences emotional reactions, e.g. embarrassment. Finally, the jeopardizing fundamental self involves having a sense of lost control and having the need to seek help. According to Engelund (2006), a person needs to be at the end of the sensing tribulation or jeopardising fundamental self stages in order to reach the transtheoretical model's contemplation stage.

The decision to take up hearing aids remains complex. Quantitative research has identified clear predictors for hearing aid uptake, such as poor hearing sensitivity and self-reported hearing disability (Jenstad & Moon, 2011; Knudsen et al., 2010; Knoetze, Manchaiah, Mothemela, et al., 2023; Meyer & Hickson, 2012; Ng & Loke, 2015). Similarly, a qualitative study using semi-structured interviews and thematic analysis found that participants (n = 32) were more likely to take up hearing aids if their self-reported hearing problem had worsened over time (Gallagher & Woodside, 2018). Another study by Poost-Foroosh et al. (2011) included 23 participants (13 adults who received a hearing aid recommendation and 10 audiologists) and used concept mapping to identify factors in the client-clinician interaction that influence hearing aid uptake. They concluded that empowering patients through client-centred interaction might improve hearing aid uptake (Poost-Foroosh et al., 2011).

Although a few qualitative studies provide important insights on hearing aid uptake barriers and enablers, little is known about the reasons for hearing aid uptake, specifically from the hearing aid user's perspective. Hearing aid users typically find themselves in later stages of change (e.g., the transtheoretical model's maintenance stage), where they have already recognized the need for hearing aids and taken steps to adopt them. The perspectives and experiences of hearing aid users can potentially support individuals in earlier stages of change (e.g., the transtheoretical model's contemplation stage) who are open to the idea of hearing aids to progress through the stages and facilitate their decision to take up hearing aids. This information is also important to inform and support hearing healthcare professionals and service-delivery models to implement strategies that can foster readiness to change, i.e. readiness to adopt and maintain behavior change (Prochaska & Velicer, 1997), in this case, willingness to take up hearing aids. Furthermore, existing qualitative studies on the topic of hearing aid uptake have used relatively small sample sizes. This study, therefore, explored the main reasons for hearing aid uptake and recommendations to others with hearing difficulties in a large sample of adult hearing aid users in the US.

METHOD

Study Design

The study was part of a larger project that aimed to investigate hearing aid experiences of adult hearing aid users that included a combination of structured and open-ended questions. The current study was limited to the analysis of responses to a single open-ended question pertinent to the current study's aim of exploring reasons for hearing aid uptake and recommendations to others from a user perspective. Institutional Review Board (IRB) approval was obtained for this study from Lamar University's Human Subjects Review Board

(Ref: IRB-FY21-248) and further ethical clearance for data analysis was obtained from the Faculty of Humanities Research Ethics Committee, University of Pretoria (Ref: HUM008/0822). The Equator network Checklist for Reporting Results of Internet e-Surveys (CHERRIES; Eysenbach, 2004) was used to report the methods and results of the study and domain 3 of the consolidated criteria for reporting qualitative research (COREQ; Tong et al., 2007) was used to report the analysis of the study (see Supplementary Material 1-2).

Questionnaire

Items for the questionnaire were identified through an iterative process by focusing on the current research identifying factors that could contribute to hearing aid experiences. The questionnaire went through two stages of review. Four audiologists piloted the questionnaire. Their suggestions were addressed and the final questionnaire was imported into Qualtrics (Qualtrics, Provo, UT) and was reviewed by team members to ensure functionality. No randomization of the items was used, and respondents were unable to change their responses once submitted. No personally identifiable data were collected.

The final questionnaire comprised of 33 closed-ended questions and 4 open-ended questions. The estimated time to complete the questionnaire was 20 min. The questionnaire consisted of five sections that included 1) structured questions regarding demographic and hearing aid related information, 2) open-ended questions regarding hearing aid experiences, 3) International Outcomes Inventory for Hearing Aids (IOI-HA; Cox & Alexander (2002)), 4) information regarding general health, well-being and social network and 5) additional demographic information.

Due to the large sample and amount of data, the current study focused on responses from section 1 and the first open-ended question in section 2. The open-ended question was formulated by a multidisciplinary team, including audiologists (DS and VM) and social psychologists (Jamie Pennebaker and Ryan Boyd). The decision to adopt hearing aids is multifaceted, often incorporating personal, social, and economic considerations. Therefore, the question was designed with extended writing prompts to provide some context and validation for the feelings that hearing aid users may have experienced (e.g., embarrassment), potentially helping them feel more comfortable in sharing their true experiences and feelings. The utilization of extended writing prompts is a commonly used method in psychology research (see other examples: Boyd et al., 2021; Robinson et al., 2016; Stanton et al., 2015). The social psychology experts ensured that the question appropriately captured the complexities of human decision-making processes. Furthermore, the length and complexity of the question were consistent with their recommendation to allow participants the space to describe their journey holistically. The question was worded 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?

Data Collection

The larger study used purposive sampling to recruit participants. Participants were only included if they were adults (18 years and older) with hearing loss who had been or were current hearing aid users. Participants included hearing aid users from the Hearing Tracker website (www.hearingtracker.com) and users from the Lexie Hearing (www.lexiehearing.com) US database. The Hearing Tracker website is an online forum for consumers where they can share their personal opinions and experiences with hearing aids through unsolicited reviews (Swanepoel et al., 2023). Hearing aid users from the Hearing Tracker community had received traditional in-person hearing care services through healthcare professionals. These services were either obtained from private hearing aid clinics, public health or discount warehouses. Users from the Lexie Hearing US database purchased self-fitting, behind-the-ear (BTE), over-the-counter (OTC) Lexie Lumen hearing aids online, along with the accompanying app (Swanepoel et al., 2023).

A link to the open questionnaire was sent out via email to the Hearing Tracker database and to the Lexie hearing aid users during October and November 2021. The link took participants to an informed consent form and participant information sheet. Participants had to give electronic informed consent before they could complete the online questionnaire. For the Hearing Tracker users, responses to the open-ended questions were required to be at least 20 words long. There was no minimum word count for the Lexie users. Participation was voluntary and no incentives were offered to participants. Furthermore, it is noteworthy that 58 hearing aid users in the Hearing Tracker group received their hearing aids for free (e.g., from the U.S. Department for Veterans Affairs) and all users in the Lexie Hearing group purchased their hearing aids. Information pertaining to the average logged completion time

was not made available to the researchers as part of the final dataset. It is noteworthy that users self-selected themselves to respond to the survey. The response rate could not be estimated as the information was not available about how many people in each of the databases received and opened the online survey.

Data Analysis

A total of 1,094 responses (827 from Hearing Tracker and 267 from Lexie Hearing) were exported to Microsoft Excel (2019), where data screening was conducted to prepare the raw data for data analysis. The following responses were excluded: Participants who did not provide informed consent (n = 26), participants who had implantable devices (e.g., cochlear implants)(n = 3), participants who had personal sound amplification systems (PSAPs)(n = 14), participants who did not answer the open-ended questions (n = 338), participants who reported that they had childhood hearing loss and had been fitted with hearing aids during childhood (n = 40). Additionally, responses were excluded if they were duplicated (n = 9) or irrelevant (i.e., responses unrelated to the question, responses related to hearing aid outcomes or responses related to barriers to hearing aid uptake only) (n = 22). Therefore, a total of 642 responses (415 from Hearing Tracker and 227 from Lexie Hearing) were analyzed.

De-identified demographic data were coded in Microsoft Excel (2019) and transferred to Statistic Package Social Sciences (SPSS) version 28 for statistical analysis. Results were analyzed using descriptive statistical measures in terms of frequency, mean, standard deviation and range. The Mann-Whitney U and Chi-square analysis were used to determine if there were significant differences between groups in terms of demographic and audiological

variables. Furthermore, 642 responses were analyzed in Microsoft Excel (2019) using qualitative content analysis (Graneheim & Lundman, 2004; Knudsen et al., 2011).

Content analysis was found to be suitable due to the nature of the responses obtained from open-ended questions, which can vary widely in terms of detail and depth. As described by Knudsen et al. (2011), qualitative content analysis pertains to the categorization of manifest content (the explicit and visible aspects of the data) and aims to provide a descriptive overview of the data. An inductive approach, which is a bottom-up approach, was used in this study (Elo & Kyngäs, 2008). This involves generating generalizations or theories based on observations of specific instances. The researcher started analyzing specific responses and identified patterns within the data, and these patterns were used to develop broader sub-categories and categories. This approach is useful when exploring new or under-researched topics, as it allows for the generation of new insights and understandings based on the specific data being collected.

The primary researcher read through the responses numerous times to get an idea of the whole. Thereafter, the responses were divided into condensed meaning units and labelled using codes, after which the codes were grouped into sub-categories and eventually into categories (Graneheim & Lundman, 2004). The iterative process of qualitative content analysis involves a constant revisiting and refining of the coding and categorization scheme. This means that as the analysis progresses, the researcher may go back and revise their codes or create new categories based on emerging patterns within the data. This process allows for a more nuanced and comprehensive understanding of the data and ensures that all relevant patterns are identified. The coding was conducted by the primary researcher and 50% of the

coding was cross-checked by an experienced qualitative researcher (EB). Any discrepancies were resolved by discussions with a third researcher (VM). Data saturation was reached after 73% of the responses (i.e., n=468) were analyzed, i.e., no new codes or categories emerged from the dataset after reaching this point. Participants did not provide feedback on findings.

RESULTS

Participant and Response Characteristics

Table 1 provides details of the participants demographics. Participant ages ranged from 22 to 93 years, with a mean age of 65.4 years (13.7 SD). Lexie users (63.7 years; 12.4 SD) were significantly younger compared to users from Hearing Tracker (66.4 years; 14.2 SD). Participants included 61.8% males, 37.7% females, 0.3% non-binary, and 0.2% preferred not to say. There was no significant difference between the two groups in terms of gender distribution (see Table 1). The duration of hearing loss ranged from 0 to 74 years, with a mean duration of 18.6 (16.3 SD). Lexie users had a significantly shorter duration of hearing loss (14.4 years; 14.1 SD) compared to users from Hearing Tracker (20.9 years; 16.9 SD). Lexie users had a significantly longer duration of hearing loss before hearing aid purchase (8.4 years; 11 SD) compared to Hearing Tracker users (6.6 years; 11 SD). In terms of self-reported hearing difficulty (i.e., hear everything, sometimes don't hear, regularly don't hear, and almost never hear), more than half of users (52%) reported that they regularly don't hear. There was a significant difference in self-reported hearing difficulties between the two groups, with Lexie users reporting less severe hearing difficulties (see Table 1).

Overall, 41.3% of participants, including all Lexie users, purchased hearing aids online. Furthermore, 36.8% purchased hearing aids from a private hearing clinic or university, 11.7%

Table 1. Comparison of demographic and audiological variables between Hearing Tracker and Lexie users

	All users (642)	Hearing Tracker users (415)	Lexie users (227)	Group difference analysis (Mann-Whitney U or Chi-square analysis: Z or X^2 value; p-value)
Age (mean; SD)	65.4 (13.7)	66.4 years (14.2)	63.7 years (12.4)	z = -3.713; p < .001*
Gender (n; %)				X^2 = 2.682; p = .262
Male	397 (61.8%)	247 (59.5%)	150 (66.1%)	
Female	242 (37.7%)	166 (40%)	76 (33.5%)	
Other	3 (0.5%)	2 (0.5%)	1 (0.4%)	
Duration of hearing loss in years (mean; SD)	18.6 (16.3)	20.9 (16.9)	14.4 (14.1)	z = -5.688; p < .001*
Duration of hearing loss before HA purchase in years (mean; SD)	7.2 (11)	6.6 (11)	8.4 (11)	z = -4.126; p < .001*
Self-reported hearing difficulty (n; %)				X^2 = 14.397; p = .002*
Almost never hear	139 (21.7%)	108 (26%)	31 (13.7%)	
Regularly don't hear	335 (52.2%)	203 (48.9%)	132 (58.1%)	
Sometimes don't hear	163 (25.4%)	102 (24.6%)	61 (26.9%)	
Hear everything	5 (0.8%)	2 (0.5%)	3 (1.3%)	
Hearing aid purchase (n; %)				X^2 = 499.584; p < .001*
Online	265 (41.3%)	38 (9.2%)	227 (100%)	
Private clinic or university	236 (36.8%)	236 (56.9%)	-	
Discount warehouse	75 (11.7%)	75 (18.1%)	-	
Others (e.g., Veterans Affairs)	60 (9.3%)	60 (14.5%)	-	
Pharmacy hearing center	4 (0.6%)	4 (1%)	-	
Fitted by hearing professional at home	2 (0.3%)	2 (0.5%)	-	
Bilateral or unilateral users (n; %)				X^2 = 7.148; p = .008*
Bilateral	592 (92.2%)	374 (90.1%)	218 (96%)	
Unilateral	50 (7.8%)	41 (9.9%)	9 (4%)	

Note: *Significant difference between Hearing Tracker and Lexie users; p < .05
Duration of hearing loss before HA purchase was calculated excluding four outliers from the Hearing Tracker group
SD = Standard deviation, HA = Hearing aid

purchased hearing aids from a discount warehouse, and 9.3% reported getting hearing aids from other places (e.g., the Veterans Affairs). A very small percentage (0.6%) purchased hearing aids from a pharmacy hearing center or (0.3%) were fitted with hearing aids by a hearing professional at their house. Most participants (92.2%) were bilateral hearing aid users. Hearing Tracker users included significantly more unilateral users (9.9%) compared to Lexie users (4%)(Table 1).

Results from the qualitative content analysis are tabulated in Tables 2-5, as outlined in the next section. The frequency of meaning units reported in each domain, category or sub-category is shown in brackets in the tables.

Reasons for Hearing Aid Uptake

Three domains emerged, containing 11 categories and 48 sub-categories. The domains for hearing aid uptake reasons included personal impact, social difficulties and auditory difficulties, as described below (see Figure 1).

Domain 1: Personal Impact

Personal impact included five categories presented in Table 2 with their respective sub-categories. Several participants indicated that they obtained hearing aids because they did not feel self-conscious about wearing hearing aids. This occurred either because they were not concerned about their appearance with hearing aids or they felt that the hearing aids were not visible, for example, *"Wearing hearing aids never concerned me. I actually ordered a red-colored BTE pair so people would notice them and understand that I was hard of hearing" (P102, 82, male)*. Some participants reported taking up hearing aids because of having access to finances, as they mentioned that they had finances available or received

Table 2. Personal impact factors contributing to getting a hearing aid (n = 596 meaning units).

Category	Sub-category	Meaning unit examples (participant ID, age in years, gender)
Barriers removed (241)	Appearance not a concern (126)	*I did not worry about the looks (P11, 72, male)*
	Hearing aids not visible (28)	*They are very discreet (P6, 42, female)*
	Provided by a third-party (34)	*I got the cheapest ones that were fully covered by insurance (P2, 50, female)*
	Availability of finances (29)	*I could afford to consider it (P3, 46, male)*
	Free hearing aid (7)	*I was gifted a pair of Kirkland hearing aids (P66, 74, female)*
	Readiness to change (12)	*It was time to get them. (P234, 76, male)*
	Accepted hearing loss (5)	*I had to go through the grieving process of losing my hear (P42, 68, female)*
Auditory-related impact (53)	Listening fatigue (29)	*I was tired of not being able to hear. (P69, 71, female)*
	Tinnitus (6)	*My ears keep ringing (P537, 64, male)*
	Balance difficulties (1)	*I can't keep my balance (P468, 25, female)*
	Consequences of untreated hearing loss (11)	*Not hearing can lead to other health issues and mental decline (P127, 61, female)*
	Auditory deprivation (4)	*To be sure I didn't lose brain activity in hearing center (P120, 67, female)*
	Realising it is a long-term condition (2)	*Deafness will endure to the end of my days! (P133, 78, female)*
Impact on education/work (146)	Ability to learn (7)	*I was starting graduate school and wanted to hear better in class (P273, 70, male)*
	Ability work (94)	*it was impacting my work (P26, 57, male)*
	Participating in meetings (28)	*would miss critical information in business meetings. (P28, 63, female)*
	Working as a teacher (13)	*I'm a college professor and needed one for my job. (P39, 68, female)*
	Working as a musician (4)	*I am a professional vocalist and it was imperative for me to hear music clearly (P54, 56, female)*
Emotional impact (110)	Reduced quality of life (56)	*It was a quality of life issue for me. (P132, 71, male)*
	Frustration (27)	*I was more <u>and</u> more frustrated (P35, 64, female)*
	Embarrassment (14)	*It was embarrassing in the least (P148, 78, male)*
	Unable to function (7)	*I could no longer function without them (P53, 56, male)*
	Lower mood and self-esteem (6)	*I had self-esteem issues initially (P290, 24, male)*
Social support and encouragement (46)	Family members (27)	*My wife has suggested a hearing aid for years. (P55, 78, male)*
	Friends with hearing aids (6)	*After talking to a co-worker who has hearing aids (P49, 58, male)*
	Work colleagues (5)	*My boss said I needed to get them (P235, 71, female)*
	Medical professionals (5)	*A medical doctor suggested that I get hearing aids. (P131, 78, male)*
	Others (3)	*I was on a plane trip and the person sitting next to me said: You really need to go get your hearing checked. (P425, 64, male)*

Note: Numbers in brackets are the frequency of the meaning units reported in each category or sub-category

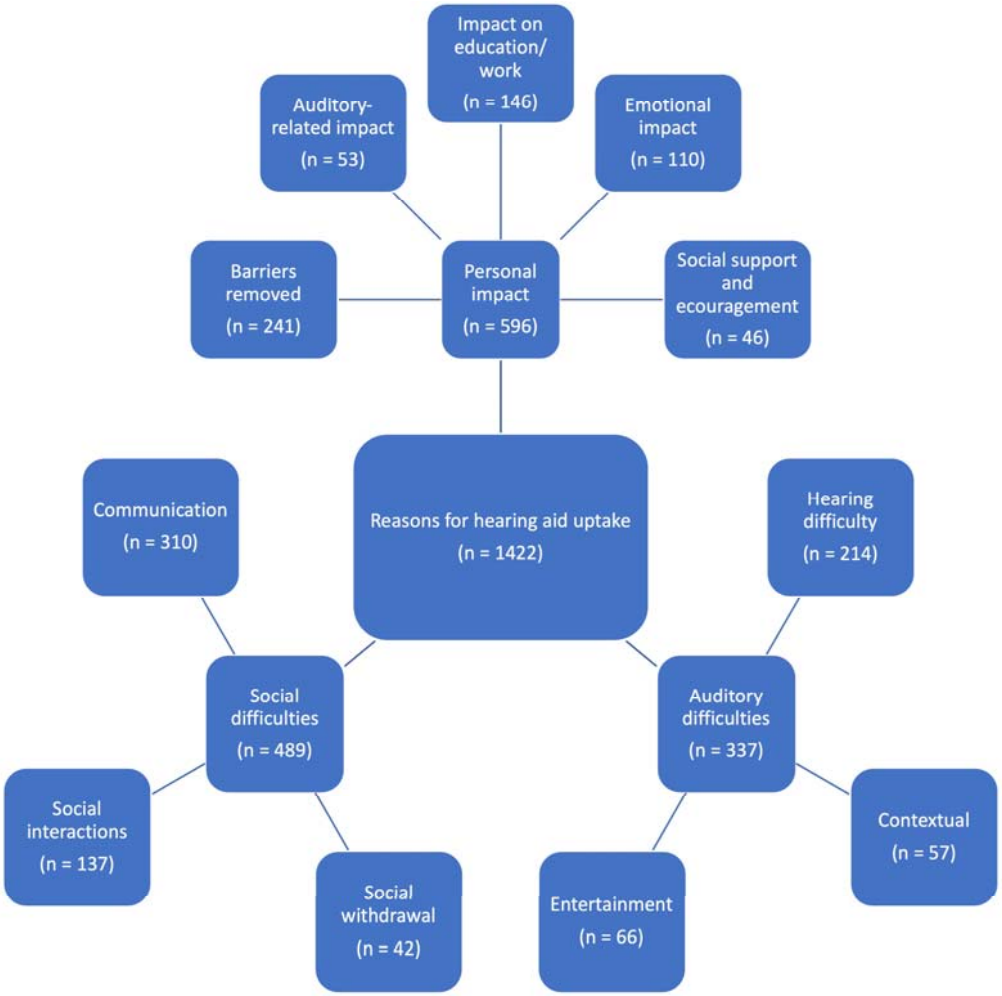

Figure 1. Domains and categories identified regarding reasons for hearing aid uptake

hearing aids from a third party (e.g., health insurance). A number of participants got hearing aids for free, e.g., as a gift or from a non-profit organization. Listening fatigue was reported as a primary reason for hearing aid uptake in regard to auditory-related impact, for example, *"straining to hear was tiring" (P205, 70, male)*. Participants also reported fearing the consequences of untreated hearing loss, particularly mental decline, as a motivating factor for hearing aid uptake.

The ability to work in general was also described as a primary reason for hearing aid uptake. Some participants specifically mentioned that they struggled to participate in meetings at work, for example, *"I was having a very difficult time hearing during meetings. I often misinterpreted what was being said so responded with comments and conversation that was off track from the discussion" (P198, 62, female)*. Teachers and musicians also reported that they had to get hearing aids due to the nature of their jobs. Learning at school or university was another reason for hearing aid uptake. Most participants reported quality of life as the main driver for hearing aid uptake in terms of emotional impact. Participants who reported frustration as the motivating factor for hearing aid uptake either referred to the frustration experienced by themselves or the frustration experienced by their friends/family. Some participants also described experiencing external pressure to take up hearing aids. The external pressure was either positive (e.g., a family member encouraging a participant to buy a hearing) or negative (e.g., a boss telling a participant they need to get hearing aids to keep their job).

Domain 2: Social Difficulties

Three categories of social difficulties were identified, following a hierarchical structure, including communication, social interactions and social withdrawal (see Table 3). One of the main reasons for hearing aid uptake was communication difficulties and social interactions, especially with family members, such as their partner, children or grandchildren, for example*, "I didn't want to miss out on communication with my grandchildren. I was fearful that if they had repeat what they said that they would stop interacting with me" (P247, 64, female)*. Struggling to interact in group settings, e.g., in restaurants or at public gatherings and socializing with friends, were further reasons for hearing aid uptake. The impact their hearing loss had on their relationships was also a motivating factor for hearing aid uptake, for example, *"and social relationships were impacted as well" (P324, 73, male)*. Realizing that they were withdrawing socially from events such as parties or shows was a further factor leading to obtaining hearing aids. Participants thus took up hearing aids to feel more comfortable in social situations. Specific speech perception difficulties that motivated participants to take up hearing aids included annoyance of not understanding speech, needing to ask for repetition and missing conversation.

Domain 3: Auditory Difficulties

Three categories emerged, namely hearing difficulty, contextual difficulties, and hearing-based entertainment (see Table 4). Participants mentioned seeking hearing aids because they desired clarity as they struggled to hear everything. They also reported auditory difficulties (difficulty hearing sounds or perceiving speech) in specific contexts as the main reason for hearing aid uptake, particularly hearing in background noise, for example, *"Couldn't follow conversations in areas with background noise" (P365, 78, female)*. Participants also

Table 3. Social difficulties contributing to getting a hearing aid (n = 489 meaning units).

Category	Sub-category	Meaning unit examples (participant ID, age in years, gender)
Communication (310)	Communication difficulties in general (101)	*Unable to communicate normally with others (P10, 25, male)*
	Difficulty understanding speech (76)	*I didn't always understand what was said. (P66, 74, female)*
	Asking for repetition (75)	*was saying "what?" too often (P11, 72, male)*
	Impacting conversation flow (58)	*I was missing conversations. (P48, 73, female)*
Social interactions (137)	Family members (103)	*I had trouble hearing my wife (P85, 58, male)*
	Friends (16)	*Do not subject friends and family to having to repeat themselves. (P45, 77, female)*
	Group conversations (18)	*I wanted to hear better when out with a group (P270, 78, female)*
	Impact on relationships (19)	*Once others around me thought I was being rude because I was not responding (P450, 52, female)*
Social withdrawal (42)	Socialization difficulties (23)	*Socializing became difficult (P133, 78, female)*
	Social isolation (20)	*I realized my increased isolation (P88, 74, female)*

Note: Numbers in brackets are the frequency of the meaning units reported in each category or sub-category

Table 4. Auditory difficulties contributing to getting a hearing aid (n = 337 meaning units).

Category	Sub-category	Meaning unit examples (participant ID, age in years, gender)
Hearing difficulty (214)	General hearing difficulty (202)	*Wanted to hear better (P29, 75, male)*
	Clarity desired (12)	*I wanted to hear more clearly (P280, 39, male)*
Contextual (57)	In background noise (25)	*Issues with conversations at a table in a noisy restaurant (P86, 81, male)*
	At home (5)	*I was having trouble hearing in my own home. (P101, 61, female)*
	Using the phone (14)	*Could not hear or use phone (P174, 75, female)*
	Environmental sounds (9)	*Couldn't hear the wind in the trees or the birds chirping (P236, 55, male)*
	For personal safety (4)	*It was more about a safety issue (P310, 58, female)*
Entertainment (66)	Watching television (50)	*Having to turn up the TV (P35, 64, female)*
	Listening to music (11)	*Wanting to hear music better (P352, 41, male)*
	Listening to radio (5)	*I noticed the volume of my car radio (P258, 73, female)*

Note: Numbers in brackets are the frequency of the meaning units reported in each category or sub-category

mentioned difficulty hearing over the phone and hearing environmental sounds like birds chirping. Hearing the television, radio or music difficulties were further reasons for hearing aid uptake.

Recommendations to Others with Hearing Difficulties

Regarding recommendations to others with hearing difficulties, 8 categories and 32 sub-categories were identified as presented in Table 5 and Figure 2. Participants either recommended getting hearing aids or at least getting a hearing test. A further recommendation was to do a hearing aid trial and do enough research before purchasing hearing aids, e.g., watching YouTube videos regarding hearing aids. The sub-categories *adjustment time* and *persist* were closely related. Participants in the sub-category *adjustment time* recommended allowing enough time to get used to wearing hearing aids, for example, *"It is physically and emotionally exhausting for the first few weeks while your brain adjusts" (P42, 68, female)* while the sub-category *persist* included recommendations to wear the hearing aids as much as possible in order to adjust, for example, *"start using the hearing aids from day one, even if it doesn't sound right" (P275, 81, male)*. In terms of support, the majority of participants from Hearing Tracker mentioned that it is important to find the right hearing healthcare professional. For some participants, this meant finding a suitable audiologist and for others it meant seeing an ENT specialist. Participants further recommended involving family or joining a support group like the Hearing Loss Association of America.

Table 5. Recommendations to others who have hearing difficulties reported by 642 participants (n = 503 meaning units).

Category	Sub-category	Meaning unit examples (participant ID, age in years, gender)
Timely help (181)	Get hearing aids (74)	*Get the hearing aids (P2, 50, female)*
	Don't delay (60)	*I recommend not waiting (P21, 71, female)*
	Get tested (46)	*Get your hearing checked (P32, 70, male)*
	Online hearing screening (1)	*Ability to get a valid audiogram *easily* is improving now through self-help access on the internet (P340, 65, male)*
Trial period (97)	Do research (23)	*I read everything I could find on the subject. (P42, 68, female)*
	Adjustment time (19)	*Give yourself a lot of time to adapt to wearing the hearing aid. (P30, 44, female)*
	Change the hearing aid style (18)	*At first I wanted small and comfortable, but as my hearing loss progressively got worse, I saw the benefit in having a BTE. (P176, 62, female)*
	Hearing aid trial (11)	*The long trial period also really helped. (P33, 73, female)*
	Persist (10)	*Getting to point where aid(s) feel right may take time and patience. (P78, 61, male)*
	Trial a range of devices (8)	*Try multiple brands (P96, 92, male)*
	Don’t rush the decision (6)	*Take your time. (P4, 34, female)*
	Ask questions (2)	*I would suggest any first time users to ask more questions (P185, 77, male)*
Support (71)	Seek the right professional (24)	*See a licensed and skilled hearing healthcare professional (P176, 62, female)*
	Find a suitable audiologist (23)	*I would recommend to find a good audiologist (P51, 80, female)*
	Quality service (15)	*Their service is beyond reproach (P137, 81, male)*
	Join a support group (3)	*get involved with other people knowing that you’re not alone (P310, 58, female)*
	See an Ear-Nose-and-Throat specialist (3)	*I will always recommend others see an ENT (P24, 64, male)*
	Involve family (3)	*Support of family is important (P132, 71, male)*
Affordability (56)	Seek affordable options (56)	*Shopped for the best value. (P32, 70, male)*
Technology (48)	Get the latest technology (15)	*Purchase the most current technology you can afford. (P312, 63, female)*
	Get Bluetooth hearing aids (14)	*Bluetooth has made a huge difference (P163, 80, male)*
	Realistic expectations (6)	*Just realize that your hearing will never be as it was (P336, 75, female)*
	Use assistive listening devices (6)	*I also use an assistive listening device (P129, 65, female)*
	Use communication tactics (4)	*I also read lips while talking with someone (P132, 71, male)*
	Get rechargeable hearing aids (2)	*rechargeable aids are great (P77, 67, male)*
	Use telecoil (1)	*I have been an outspoken advocate for telecoil technology (P292, 83, male)*

DTC hearing aids (21)	Get DTC hearing aids (18)	*I found a way to get aids that I could adjust myself…less costly and not at all difficult* (P342, 82, male)
	Don't get DTC hearing aids (3)	*Not buy over the counter or online (P226, 83, female)*
Adjustments (13)	Get adjustments (10)	*Many adjustments with aids (P111, 67, male)*
	Adjust for different environments (3)	*Make a list of situations that you struggle in and go for adjustments (P4, 34, female)*
Advocacy (16)	Make people aware (11)	*Let them know you're a hearing aid user (P290, 24, male)*
	Forget what others think (5)	*Forget about what others think about using hearing aids (P275, 81, male)*

Note: Numbers in brackets are the frequency of the meaning units reported in each category, sub-category or code, DTC=Direct-to-Consumer, ENT=Ear, Nose and Throat specialist, HOH=Hard of Hearing

Figure 2. Categories identified regarding recommendations to others with hearing difficulties

Recommendations to shop for cheaper hearing aids or to consider finance options were also common, for example, *"research for best prices" (P232, 68, male)*. Some participants recommended purchasing hearing aids with specific features like rechargeable batteries or Bluetooth. In terms of direct-to-consumer (DTC) hearing aids, participants either recommended getting DTC hearing aids because they are more accessible and affordable or not getting DTC hearing aids because they do not work as well as hearing aids that are recommended by a hearing healthcare professional. Participants further mentioned that getting hearing aid adjustments can be helpful. They either reported getting many adjustments in order to be satisfied with hearing aids or specifically getting the hearing aids adjusted for different environments. For others to attend to communication needs, they recommended making people aware of your hearing loss or hearing aids, for example, *"Wear a pin that says please face me so I can hear you" (P243, 68, female)*.

DISCUSSION

This study explored the main reasons for hearing aid uptake and recommendations to others with hearing difficulties using qualitative content analysis of responses from 642 hearing aid users. Reasons for hearing aid uptake were categorized into three domains (personal impact, social difficulties, and auditory difficulties), containing 11 main categories and 48 sub-categories. Recommendations to others with hearing difficulties constituted eight main categories (timely help, trial period, support, affordability, technology, direct-to-consumer hearing aids, adjustments, and advocacy) and 32 sub-categories.

The majority of the categories identified in this study have been reported as factors influencing hearing aid uptake in quantitative studies (Jenstad & Moon, 2011; Knudsen et al.,

2010; Knoetze, Manchaiah, Mothemela, et al., 2023; Meyer & Hickson, 2012; Ng & Loke, 2015). However, when considering the sub-categories, this study provided more insights with more specific and detailed reasons for hearing aid uptake reported. For example, communication difficulties have been identified as a predictor for hearing aid uptake (Humes & Dubno, 2021). Still, in this study, participants described specific speech perception difficulties that motivated hearing aid uptake, such as asking for repetition. Unlike other qualitative studies on this topic, this study reported a wide range of reasons for hearing aid uptake, some of which have not been reported before. Most research in healthcare is focused on why people do not seek help or take up interventions. For example, studies in the field of psychology tend to focus on why people avoid treatment for mental illness (Muhorakeye & Biracyaza, 2021; Radez et al., 2021). Like the aforementioned, most studies in audiology have focused on reasons people do not seek help/take up hearing aids. However, it may be more effective to promote hearing aid uptake by focusing on the factors that motivate a person to take up hearing aids, as reported by the hearing aid users in the present study, as opposed to focusing on the barriers. Although our sample of hearing aid users may not be representative of all potential hearing aid users, we believe that the insights gained from our sample of hearing aid users can still be useful for informing interventions to support those in earlier stages of change who are open to the idea of using hearing aids to progress through the stages and facilitate their decision to take up hearing aids.

A key takeaway from this study is that some people do not only take up hearing aids to improve their hearing but also to improve their general well-being. Reasons for hearing aid uptake could be identified in all three core well-being dimensions, namely socio-emotional well-being, cognitive well-being and physical well-being (Vercammen et al., 2020). For

example, some participants reported taking up hearing aids to improve their quality of life (socio-emotional well-being), prevent auditory deprivation (cognitive well-being), or for personal safety (physical well-being). This is encouraging as it is in line with the recent call for action to change the narrative of hearing health to be framed within the broader context of healthy living (Saunders et al., 2021). It highlights the need for hearing healthcare professionals to broaden their perspective on hearing health and the potential benefits of hearing aids on various dimensions of well-being. Therefore, hearing healthcare professionals should incorporate discussions on well-being and quality of life in their consultations and highlight the positive impact of hearing aids on quality of life.

Although many personal impact factors contributed to taking up hearing aids, most participants reported hearing aid uptake because of having access to finances and not feeling self-conscious. These two factors are typically reported as barriers to hearing aid uptake (Fischer et al., 2011; Wallhagen, 2009) and removing these barriers may increase an individual's motivation to progress through the stages of change and take up hearing aids. In line with Rolfe and Gardner (2016), some participants in the present study felt less self-conscious because their hearing aids were discreet, whereas others were not concerned about their appearance with the hearing aids. Hearing healthcare professionals should increase visibility and public acceptance of hearing loss and hearing aids to support lower stigma and improve hearing aid uptake, as suggested by Rolfe and Gardner (2016). Hearing loss must be treated as a component of overall health, and hearing healthcare professionals should promote hearing assessment and treatment to destigmatize hearing loss, as also recommended by Wallhagen (2009). Moreover, it is important for hearing healthcare professionals to consider the social representation of hearing aids (whether hearing aids are

viewed as acceptable or not), as this may vary from country to country (Chundu et al., 2021). Cross-cultural differences need to be considered to develop culturally sensitive health campaigns that can improve perceptions about hearing aids (Chundu et al., 2021). Furthermore, cost as a barrier to hearing aid uptake should be addressed. Participants frequently reported taking up hearing aids because of the availability of finances or financial support. A recent systematic review by Knoetze, Manchaiah, Mothemela, et al. (2023) also revealed that having access to financial support (e.g., receiving funding from a third party) can positively affect hearing aid uptake. The availability of affordable hearing aid options or financial assistance could therefore improve hearing aid uptake.

Hearing aid uptake was motivated either intrinsically when participants felt ready to seek help for their hearing difficulties or extrinsically due to social support and encouragement, as also indicated by Rolfe and Gardner (2016). Similarly, a recent systematic review (Knoetze, Manchaiah, Mothemela, et al. 2023) reported that hearing aid uptake was positively associated with social pressure, although autonomous motivation also positively affected hearing aid uptake suggesting a largely self-determined behavior. Therefore, external motivation can have a positive impact on hearing aid uptake, but for an individual to take action and adopt hearing aids, they need to be intrinsically motivated to change. Raising awareness regarding the benefits of hearing aids, such as improving psychosocial functioning (Oosthuizen et al., 2022), reducing listening fatigue (Holman et al., 2021), and reducing the risks of cognitive decline (Livingston et al., 2020) are important priorities for hearing healthcare professionals. This could support intrinsic motivation to obtain hearing aids since these were reported to contribute to hearing aid uptake. The transtheoretical model suggests that various factors, such as the perceived benefits of behavior change, influence an

individual's readiness to change. Therefore, people who recognize and value the potential benefits of hearing aids might be more likely to show readiness to change and take up hearing aids.

It is well known that hearing loss can cause social difficulties, including social isolation, which can lead to other mental health problems (Shukla et al., 2020). Thus, it was expected that social difficulties, such as communication difficulties, social interactions and social withdrawal, would be reported as motivating factors for hearing aid uptake. A study by Humes and Dubno (2021) reported similar findings and concluded that people with poorer communication performance and increased awareness of communication problems were more likely to seek help and take up hearing aids. Similar to what participants reported in this study, communication partners can also experience communication difficulties, social restrictions and less relationship satisfaction because of their partners' hearing loss (Kamil & Lin, 2015; Manchaiah et al., 2012). Therefore, it may be helpful for hearing healthcare professionals to involve communication partners like family members in discussions about interventions (Kamil & Lin, 2015; Manchaiah et al., 2012). This will extend a patient-centered care approach to a family-centered care approach, which can address the communication needs of the patient and their family (Nerina et al., 2013). In previous qualitative studies, hearing aid users also reported that social support from family/friends encouraged them to use their hearing aids more often (Dawes et al., 2014; Lockey et al., 2010).

In the auditory difficulties domain, similar to Gallagher and Woodside (2018), participants predominantly reported taking up hearing aids because of self-reported hearing difficulty. Some participants specified the context, for example, difficulty hearing sounds or perceiving

speech in background noise, at home or over the phone. Poor hearing sensitivity, whether it is self-reported or measured using pure tone audiometry, has previously been identified as a strong predictor of hearing aid uptake (Knoetze, Manchaiah, Mothemela, et al., 2023; Knudsen et al., 2010). This emphasizes the importance of hearing screening for hearing healthcare professionals to increase awareness of hearing loss and potentially improve hearing aid uptake (Rolfe & Gardner, 2016). Participants also mentioned taking up hearing aids for entertainment purposes, like watching TV. A study by Strelcyk and Singh (2018) showed that hearing aids could alleviate listening difficulties while watching TV. They also found that hearing aid users watched TV for approximately 6 hours longer than non-users (Strelcyk & Singh, 2018). It is important to note that some people might not use hearing aids regularly but only use them for entertainment purposes, such as watching TV, and still describe themselves as satisfied hearing aid users (Laplante-Lévesque et al., 2011). When providing counselling regarding intervention options, it may be helpful for hearing healthcare professionals to incorporate the potential benefits of hearing aids for specific situations or purposes (e.g., for entertainment), as some people take up hearing aids mainly for this reason.

In a previous analysis of the same data, we compared the user perspectives related to reasons and recommendations for hearing aid uptake between Lexie and Hearing Tracker users (Knoetze, Manchaiah & Swanepoel, 2023). This analysis showed that the Lexie users, who were significantly younger and potentially more socially active, were more likely to adopt hearing aids due to difficulties in social interactions with friends. Lexie users also reported listening fatigue as a reason for hearing aid uptake more often. On the other hand, Hearing Tracker users, who were significantly older, mentioned the consequences of untreated hearing loss, particularly related to cognitive decline and dementia, as a motivating factor for

hearing aid uptake more frequently. This could be due to their age and the guidance from hearing healthcare providers during clinical consultations. Therefore, raising awareness about the benefits of hearing aids, including reducing listening fatigue and cognitive decline, can encourage the adoption of hearing aids in both groups.

To our knowledge, this was the first study to document hearing aid users' recommendations to others with hearing difficulties. Literature on recommendations to others with similar health problems is also limited in other health areas. The present study reported several recommendations to others with hearing difficulties covering the entire patient journey, including pre-fitting recommendations, e.g., seeking hearing help to post-fitting recommendations, e.g., getting hearing aid adjustments. These recommendations seem to be aligned with typical hearing healthcare professional recommendations and may suggest that people who accept and repeat clinical recommendations from a hearing healthcare professional are more likely to take up hearing aids. Hearing Tracker users were more likely to recommend not to delay seeking help and more likely to suggest getting a hearing test (Knoetze, Manchaiah & Swanepoel, 2023). This could be attributed to the fact that Lexie users were not required to take a hearing test. Hearing Tracker users also had poorer self-reported hearing difficulties and longer duration of hearing loss, which may contribute to their emphasis on timely help. Additionally, Hearing Tracker users were more likely to recommend changing the hearing aid style, which is understandable considering the wider variety of options available for prescription users compared to Lexie users who only had the option of behind-the-ear hearing aids. More research in this area is required as this information can assist hearing healthcare professionals and service-delivery models to better appreciate what hearing aid users value and what may improve hearing aid uptake.

Study Limitations

While our study was the first to report reasons for obtaining hearing aids from a user perspective, it has some limitations. Firstly, there is a potential sampling bias due to participant recruitment and self-selection. Secondly, Lexie participants were verified hearing aid users, as they had to purchase Lexie hearing aids, whereas Hearing Tracker participants could not be independently verified, as we relied on their self-reported hearing aid usage in the larger study. Thirdly, the complexity of the open-ended question, with multiple sub-questions, may have led to selective responses. Fourthly, Lexie participants were not assigned a minimum word count requirement, resulting in some concise responses with limited contextual information. Lastly, our sample consisted of individuals who had already taken up hearing aids and may not represent all potential hearing aid users, especially those who are strongly opposed to using hearing aids or who face significant barriers to accessing hearing aids. Nonetheless, our study provides valuable insights into why individuals choose to take up hearing aids and can inform interventions aimed at improving hearing aid uptake among those who are at the stage of change where they are open to the idea of using hearing aids. While our study does not directly relate to the readiness literature due to retrospective questioning, it indirectly contributes by exploring the underlying motivations for hearing aid uptake.

CONCLUSIONS

The hearing aid user perspective on reasons for hearing aid uptake have been drawn from a much larger sample compared to previous qualitative studies. Most factors motivating hearing aid uptake were intrinsic, suggesting that it is primarily a self-determined behavior. Hearing healthcare professionals should, therefore, be aware of a person's readiness for

change for successful intervention uptake. However, some important extrinsic factors reportedly influence hearing aid uptake, such as the availability of finances and social support. These factors should be taken into account by hearing healthcare professionals to support change as well as used when developing public health approaches to promote hearing aid uptake. The most frequent recommendation to others was not to delay seeking hearing help and to get hearing aids. Earlier detection of hearing loss through screening programs could support hearing help-seeking and hearing aid uptake. Overall, the study results suggest that the process of and reasons for obtaining hearing aids are highly personal and are due to diverse reasons. In retrospect, hearing aid users tend to appreciate the benefits of getting hearing aids early in their hearing care journey, as evident from their recommendations to others. Hearing healthcare professionals should broaden their perspective on hearing health and emphasize the benefits of hearing aids, such as improving psychosocial functioning, reducing listening fatigue, reducing the risks of cognitive decline, and enhancing the overall quality of life. There is a need for future research to develop strategies that can facilitate change and encourage hearing aid uptake among those who are hesitant towards using hearing aids.

DATA AVAILABILITY STATEMENT

The data analyzed during the current study are available from the corresponding author upon reasonable request.

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