

Measuring the Impact of Illness Perception on NHS Audiology Service Usage in Presbycusis
Patients- A Feasibility Study

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6110 words

Abstract

Coping behavior in adult hearing loss is still not well understood. Despite the high prevalence of hearing loss in those over 65, many people do not seek help for hearing loss. The common sense model of illness perceptions suggests that illness perceptions are a strong predictor of adapted coping behaviours, including help-seeking, and take up of treatments.

Purpose: This study aimed to determine the feasibility of using the brief Illness Perceptions Questionnaire to measure the impact of illness perception in predicting usage of NHS Audiology services.

Methods : Twenty-four volunteers were recruited from a standard NHS Audiology Outpatient clinic and Illness Perception was measured using the brief Illness Perception Questionnaire. Two different recruitment strategies were explored and compared in terms of recruitment and retention rates. Comprehensibility of the questionnaire was assessed by Think Aloud Analysis in a subset of participants, while possible risks and burdens were monitored in structured telephone interviews.

Results: The questionnaire is a comprehensive and quick tool to measure individual Illness Perception at minimal cost. We suggested minor adaptations of three questionnaire items to increase comprehension. Participants preferred to complete the questionnaire after their appointment at the clinic facilities rather than at home prior to their hearing assessment appointment.. There were no identified risks or burdens to participants in this study.

Conclusions: This approach met our criteria for feasibility. Understanding the impact of Illness Perception on patients' coping behaviour in presbycusis could improve treatment outcomes and increase patient satisfaction, while promoting a more efficient and individualised Audiology service.

Key words:

Presbycusis

Coping

Illness perceptions

Audiology

1.1 Background

In 2014, citizens over the age of 65 accounted for 17.7 % [11.4 million individuals] of the UK population with these numbers being expected to rise in line with increasing life expectancy [[1]]. The requirement to meet the clinical needs of this growing ageing population in a patient-centered and cost-effective manner has become one of the major challenges of the National Health Service [NHS] [[2]].

Despite the high prevalence of presbycusis and the potential impact of this condition on patients' life, only a minority of affected individuals seek professional help for their condition [[3;4;5]]. Research has shown that hearing-impaired subjects over the age of 55 wait on average 10 years until actively seeking help for their hearing loss [[6]].

Subjects diagnosed with at least a mild hearing impairment have access to different treatment options, including digital hearing aids [7], assistive listening devices [8] or communication tactics [9]. In line with patient centered care and shared decision making [10] patients can chose their treatment option to fit their needs and lifestyle [11] or also decide not to be treated and/or simply monitor their hearing loss. Despite treatment being freely available and easily accessible only 1- 40% of hearing aid owners regularly use their amplification [12; 13;14].

While it is well known that many hearing impaired subjects choose to abandon their hearing rehabilitation plan [15], the factors influencing this coping behaviour are still poorly understood.

Surveys of attitudes towards hearing services using the Hearing Attitudes in Rehabilitation

Questionnaire [HARQ] have revealed variations in the willingness to use hearing aids, perceptions of social pressure to attend to treating hearing loss and perceptions of hearing difficulties [16]. In addition, socio-economic variation contributes to differences in views of hearing loss [17,18,19]

Those who report hearing problems restricting their participation in conversations and other hearing related activities were more likely to seek professional help [18; 19;20]. In addition, hearing thresholds were more severe in help-seekers compared to non-help-seekers [19].

Subjects who showed a better acceptance of their hearing difficulty and experienced their own hearing loss as less stigmatizing were more likely to try hearing aids [21]. Higher self-perceived participation restriction due to hearing loss and acceptance of hearing loss were positively associated with purchasing hearing aids [22] and usage of the same [23]. Individuals with higher self-perceived hearing difficulties before the fitting appointment also showed higher use and satisfaction with hearing aids post-fitting [24]. It is clear that significant variations in perception are present in the population managing hearing loss and that the process of help-seeking and engaging with services is dependent on individual views and perceptions of their hearing [25]. However, audiology services are still structured around a single pathway for help-seeking – most commonly assessment and fitting of hearing aids, with little attention to the individualized needs of the patient.

Patients use a variety of behavioral and/or cognitive strategies to adapt to the emotional and physical stressors caused by health changes, which are referred to as their personal coping behaviour. Similar variations in healthcare are understood through the self-regulatory model of illness, which explains the variation in coping behaviors [26,27].

The brief illness perceptions questionnaire is designed to capture this variation in coping

[27,28].

The brief illness perceptions questionnaire [bIPQ] contains only 9 items, but has been validated for various chronic illnesses [28]. It has further been shown to be highly repeatable and valid in distinguishing between different diseases [28].

The related revised illness perceptions questionnaire has been applied to study the association between illness perception and help-seeking behaviour in individuals with King-Kopetzky syndrome [29]. Help-seeking was significantly associated [$p < 0.001$] with a belief in significant consequences of not hearing [29]. This variation explained help-seeking when controlling for audiological factors.

Research in other common chronic conditions including hypertension, diabetes and asthma showed that patients' beliefs about their respective illness were strong predictors for their choice of coping behaviour [28; 29;30]. Furthermore, a meta-analysis showed that illness perceptions did not only predict coping behaviours but also treatment outcomes [27;30;31;32]. Therefore illness perceptions could provide a valuable way of modelling individual differences in use of hearing healthcare and coping with hearing loss.

Objectives

The overall aim of the study was to explore illness perceptions in help-seeking presbycusis patients, to better understand the impact of patients' beliefs on engagement and uptake of NHS Audiology services.

As a feasibility study of the future research described above this project aimed to:

1. Predict response and questionnaire completion rates.

2. Explore the feasibility of different methods of recruitment and administration of measures.
3. Assess the comprehensibility of the brief IPQ for our participants.
4. Determine the burden and risks for patients associated with participation in the feasibility study.

2 Material & Methods

Measuring Feasibility

Feasibility studies are often described as first trials of a larger research project, designed to assess the proposed methods and give initial indications about putative associations, which might warrant further investigation on a larger scale [33].

This study aimed to recruit new adult Audiology patients with presbycusis, the most common form of acquired hearing loss. We invited all subjects referred for an initial hearing assessment under the Any Qualified Provider [AQP] [34] framework. The Adult Hearing AQP Implementation Pack [34] states that an AQP referral is contraindicated for subjects under the age of 55 or with symptoms indicative of complex forms of hearing difficulties [i.e. ear infections, otalgia, sudden hearing loss, conductive hearing loss, asymmetrical hearing loss and tinnitus or balance problems]. In line with these guidelines, we aimed to include first time Audiology patients over the age of 50 years, with an acquired symmetrical sensorineural hearing loss [pure-tone average > 20 dB HL], who were proficient in the English Language.

Patients were invited to participate by including the invitation letter and research information in their appointment confirmation letter. We applied two different recruitment strategies. During the first half of our recruitment period, participants were asked to complete the brief IPQ at the clinic facilities after their appointment. This was referred to as “clinic” recruitment strategy. Subjects invited during the second half of recruitment were sent the questionnaire included in their research information pack prior to their appointment. These “postal” recruitment participants had the option to either complete the questionnaire at

home in preparation to their appointment or at the clinical facilities. Design of the feasibility study is further summarised in Table 1.

TABLE 1 HERE

2.2 Data collection

Illness perception was assessed in all participants using the bIPQ [28]. This questionnaire contained 9 items representing cognitive illness representations, emotional representation, causal representations and comprehensibility of the disease [28]. Items 1 to 8 applied a response scale ranging from 1 to 10, whereas causal representations are assessed using an open-ended question format [28].

2.3 Analysis

This research applied a mixed methods approach to measure feasibility of a future larger study. While recruitment and retention rates were measured quantitatively, comprehensibility of the brief IPQ and acceptability of this measure to patients was analysed by qualitative methods.

2.3.1 Comparison of recruitment strategies

To determine the most suitable recruitment method and questionnaire administration, both recruitment strategies were compared in terms of recruitment rate [percentage of

invited subjects, who chose to participate] and retention rate [percentage of participants who completed both questionnaire and telephone follow up].

2.3.2 Think Aloud Analysis

A subset of participants recruited as part of the clinic recruitment strategy were approached by the researcher [LW] to take part in the Think Aloud analysis. These participants were purposefully selected to represent the range of presbycusis patients commonly encountered in clinic in terms of age, gender, complexity of hearing loss and social background.

Candidate 4 reported not to have noticed any changes in her hearing and told us that she had been referred to the hearing assessment following an unexpected positive screening test result conducted at a private hearing aid dispenser. She was one of the two participants, who decided to monitor her hearing loss. Unlike candidate 4, all other candidates reported to be well aware of their hearing difficulties. Their aim of the hearing assessment was focused on improving their hearing ability in different social situations. The remaining 4 candidates included in the Think Aloud analysis chose to trial bilateral hearing aids.

In this qualitative analysis subjects were asked to verbally express their thoughts while completing a task according to defined instructions. This analysis aimed to understand which parts of an instruction are utilised to solve the task at hand and determine the comprehensibility of the instructions [35]. Subjects were instructed to think out loud and express what they were thinking while completing the bIPQ. If subjects stopped talking for more than 5 seconds, they were reminded to “keep thinking out loud” by the researcher. Participants did not complain about these additional instructions. All participants were asked to read out each questionnaire item and gave consent to record the complete

analysis by audiotape.

Recruitment for the Think Aloud analysis was stopped upon reaching saturation in identified comprehensibility issues. Previous research applying this method suggested saturation to be reached after 4-7 participants had completed the analysis [35].

Recordings from the Think Aloud analysis were transcribed by the researcher [LW] and analyzed according to the protocol by Fonteyn et al. [35,37]. In brief, problems noted during the Think Aloud analysis were coded into three concepts of reference:

- A. Re-reading of the question or instructions.
- B. Participants expressing difficulties in comprehension of the question or expressing reasoning incoherent with the respective question, indicating misinterpretation.
- C. Participants being unable to answer the question.

The Think Aloud requires only low sample sizes to understand how patients utilize the instructions and information given in the questionnaire. Nevertheless, the ability to think out loud does not come natural to all individuals. Previous studies applying this method used a practice task to motivate participants to express their thoughts.. To ensure validity of this analysis, a subset of transcripts were analysed independently by the research student and the chief investigator and the identified concepts of reference compared between both researchers. All analysis steps were noted for later reference.

2.3.3 Telephone interview

Risks and burdens posed to subjects by completing the bIPQ were investigated in a short

structured telephone interview. Participants were contacted by the researcher via the telephone within 3 weeks of their initial hearing assessment. The research student would introduce herself and name the reason of her call. All telephone interviews were started with the same open question: "What was it like for you to complete the questionnaire?". If participants would not expand on this on their own, the researcher would continue the interview with 4 further questions regarding:

- Length of the questionnaire [e.g. "Did you find the questionnaire too short or too long?"]
- Comprehensibility of the questions ["Did you find it difficult to answer any of the questions?"]
- Inconvenience caused to individuals by participating in the research study ["Did completing the questionnaire cause you any inconvenience?"]
- Preferred location and timing of questionnaire completion [i.e. "would you have preferred to complete the questionnaire at home in advance to your appointment?"]

The researcher transcribed all responses to the telephone follow up simultaneously while conducting the interviews.

2.3.4 Measures of Feasibility

This feasibility study examined the parameters for future research into the illness perception of presbycusis. A progression to the ultimate study was deemed feasible if the majority of the following requirements could be met.

1. Feasibility will be assumed if on average 3 subjects could be recruited per week.
2. Eligibility will be deemed suitable if approximately 85% of participants meet the defined inclusion criteria.
3. A retention rate of approximately 90% will be assumed as threshold for feasibility.
4. To allow future research, treatment choice has to be recorded in 95% of participants, .
5. Questionnaire items will be deemed incomprehensible if they are misinterpreted or deemed unanswerable by at least 2 participants in the Think Aloud analysis. Furthermore, questionnaire completion times reported by participants in the telephone interview should not exceed 10 minutes.
6. Questionnaire items achieving completion rates below 80% will be further assessed for comprehensibility in the telephone interview.

7. The telephone interview will be deemed a suitable and time efficient method if researchers are able to complete 90% of interviews within 3 weeks of the clinic visit.

8. Themes reported as a risk or burden by at least 30% of participants in the telephone interview will merit further investigation.

3 Results

3.1 Recruitment and retention rates

Recruitment and Sample

Participants were randomly recruited from the adult rehabilitation outpatient population of an English Audiology department. All participants had been referred by their General Practitioner for an initial hearing assessment. All participants used the Choose and Book online appointment booking system to independently choose their time and date of clinic visit. All patients booked into the first clinic of the week were invited to participate in the study. According to the 2011 Neighbourhood census, 66.9% of the location citizens identified themselves as white British [1]. General health was slightly above national average with 85.5% of citizens having described their health as good and only 13% of people suffering from long term illness [1]. Education status of is above the regional average for England with 34.8% of citizens having achieved level 4 qualifications [1].

Our final study sample included 13 men and 11 women, ranging in age between 51 and 92 years. All participants were recruited from the area in and around Reading. Most participants were of British white ethnicity; one participant was Spanish and one of Asian background. The majority of our participants were retired and lived with their partners or family members. All participants were able to read and speak English fluently.

Treatment choices were recorded for all participants. Only two participants chose to monitor their hearing loss, while all remaining participants decided to trial unilateral or bilateral hearing aids and were provided with a hearing aid fitting appointment.

A summary of the demographic profile of all participants is presented in table 2.

Table 2 HERE.

Participants have been presented in terms of gender distribution, age [range and mean], ethnicity and complexity of hearing loss [AQP or non-AQP] and whether subjects are new or existing patients. Treatment choices and recruitment arm are listed for all participants.

[]To determine whether participation was influenced by demographic factors, we compared participants and non-participants. There was no significant difference between participants and non-participants in regards to age [Student's t-test, $p=0.67$], gender [Pearson's Chi-square test, $p=0.783$], their complexity of hearing loss [Pearson's Chi-square test, $p=0.179$] or whether they were new or existing patients [Pearson's Chi-square test, $p=0.741$].

Recruitment was conducted over a phase of 7 weeks with 44 subjects having been invited to take part. During this time, we were able to recruit 24 participants [3.43 participants/ week], resulting in an overall recruitment rate of 54.5%. Only 15.9% of invited subjects visiting the clinic for a hearing assessment met our inclusion criteria:

52.3% were existing Audiology patients, while 59.1% did not meet our inclusion criteria in regards to age or complexity of hearing loss. Furthermore, 27.3% of invited subjects were neither new nor did they meet the AQP criteria.

Twenty participants could be followed up via the phone. Telephone follow up was attempted

at three different dates and recorded as not completed if unsuccessful after the third attempt. We were unable to contact 4 participants, resulting in an overall retention rate of 83%.

3.2 Comparison of recruitment strategies

Both recruitment strategies were compared in terms of recruitment and retention rates. The clinic recruitment was deemed more successful in terms of both measures, with a recruitment rate of 59.1% and a retention rate of 100%, compared to 50% and 63% response to the postal recruitment strategy, respectively. Furthermore, the majority of postal recruits still chose to complete the bIPQ after their hearing assessment in the clinic area rather than having completed it at home in preparation to their appointment.

3.3 Brief IPQ results

Illness Perception was measured in all 24 participants using the bIPQ. Responses were summarised per questionnaire item and are described below in table 3.

TABLE 3 HERE

The effect of hearing loss on participants' life [item1, consequences] showed a wide distribution. Most subjects suspected their hearing loss to last for a long time up to forever [item 2, timeline]. The perception of control over their hearing loss differed widely between participants with 6 participants feeling they had no control over their hearing loss at all [item 3, personal control]. All subjects believed their future treatment to be helpful [item 4, treatment control]. Five participants were unable to complete question 5 [identity]. The

remaining 15 participants answered this question rather neutrally, resulting in a median score of 5. All subjects expressed some kind of concern regarding their hearing loss [item 6, illness concern]. Most participants understood the processes leading to their hearing loss [item 7, coherence]. The emotional representation of hearing loss differed widely between participants, with only three participants reporting no emotional effects at all [item 8, emotional representation].

Recorded responses were widely distributed for items 1, 3 and 8 of the questionnaire [covering consequences, personal control and emotional representation of hearing loss, respectively], indicating that illness perception in presbycusis patients might be most variable in these three domains.

Questions 2 and 5 appeared to be the two least comprehensible questionnaire items, which were left unanswered by 2 and 5 participants, respectively. The distribution of bIPQ scores per question are graphically depicted in Figure 1 to Figure 8 .

Figure 1,2,3,4,5,6,7,8 HERE

Causal factors reported in item 9 of the questionnaire were organised into causal themes and are presented in Table 4. Five causal themes were identified with noise exposure, ageing and hereditary factors among the most commonly mentioned themes. Furthermore, two subjects mentioned a causal factor attributed to ear pathology and external factors affecting their hearing ability, respectively. Causal factors mentioned by more than one

participant have been only listed once in Table 4.

Table 4 HERE

3.4 Comprehensibility of the bIPQ

All issues noted in the Think Aloud analysis were summarised in Table 4 and are discussed in detail below.

Four candidates requested re-instruction regarding the general completion of the multiple-choice questions [items 1-8 of the bIPQ]. These requests entailed mainly whether the chosen answer had to be circled or ticked. After re-instruction, all participants were able to complete the bIPQ. There were no reported issues regarding items 1 [“How much does your hearing loss affect your life?”], 3 [“How much control do you feel you have over your hearing loss?”] and 6 [“How concerned are you about your hearing loss”] of the questionnaire.

One candidate was unclear about the degree of hearing loss addressed by item 2 [“How long do you think your hearing loss will continue?”] and divided her answer into present and future hearing loss.

“Does that mean at its present level...or...just a hearing loss? So if it’s at its present level...forever. If it’s going to get worse....short time, because I think it will get worse.”

Two participants were unclear about the treatment options addressed in item 4 [“How much do you think your treatment can help your hearing loss?”].

“What do they call a treatment please?”

“I don’t know what treatment I am going to have if any.”

Three of the 5 participants experienced problems upon answering item 5 ["How much do you experience symptoms from your hearing loss?"] and were unclear what symptoms entailed in this specific case.

"Mmm...well I just can't hear...mmm...so....I put 3 cause it's only slight.

"Eh, I don't really understand that one."

As a result of this two subjects were unable to complete item 5. The same two candidates expressed further comprehension issues regarding item 7 ["How well do you feel you understand your hearing loss?"].

"I don't understand that."

"I don't quite know again what that means."

One subject had to re-read item 8 ["How much does your hearing loss affect you emotionally?"] for clarification, but was then able to answer this question without problems.

Candidate 5 felt that she had to report three factors that might have caused her hearing loss in question 9, although she could only think of one reason spontaneously.

"Old age. I don't really know what else to put here. It could be hereditary, could it? I can't spell it [laughs]....oh dear. A third one...oh people don't speak clearly these days."

TABLE 5 HERE

3.5 Risks and burdens

Risks and burdens associated with participation were investigated in a short telephone follow up for participants. On average, follow up phone calls were completed within 12 days after the initial hearing assessment.

Participants noted that they found the questionnaire mostly easy to complete and judged the length of the questionnaire as acceptable. Two participants mentioned difficulties understanding a particular question. In response to the question whether subjects would have preferred to complete the questionnaire in a different environment or at a different time point, the majority of subjects reported that they preferred to complete the questionnaire at the clinic subsequent to their initial appointment. They noted that if left to complete the questionnaire at home they might have forgotten to do it.

3.6 Feasibility

We were able to recruit on average 3.42 participants per week, exceeding our feasibility criteria of at least 3 participants per week. The overall retention rate amounted to 83% of participants and reached 100% in the clinic recruitment strategy alone, thus meeting our predefined standards for feasibility of the ultimate study.

Nevertheless, only a minority of participants [37.5%] met our original recruitment criteria in terms of complexity of hearing loss and being first time audiology patients. To increase recruitment rates it was decided to widen our inclusion criteria and include these patients in the feasibility study.

Treatment choices had been recorded for all participants as defined in the feasibility criteria.

Questionnaire items 5 and 7 showed most issues in the Think Aloud analysis, while item 2 was left unanswered by 2 of the 24 participants. These items will be discussed in more detail below. The time required to complete the BIPQ did not exceed 10 minutes.

Telephone interviews were completed in 83% of participants and generally completed within three weeks of the clinic visit. There were no reported risks or burdens in the telephone interviews.

4 Discussion

According to Leventhal's Common Sense model of Illness [38] Illness perceptions form only the first step in a cascade of decisions made by patients regarding their coping behaviour. Understanding and being able to predict the decision processes leading to certain coping behaviours would enable Audiologists to tailor their care. This could further have strong financial implications for NHS Audiology services, by reducing unnecessary appointments and limiting the number of unused hearing aids.

As a feasibility study, the main question to be answered by this research was whether a future study would be deemed feasible and which changes should be suggested to improve feasibility.

The recruitment and retention rates achieved in this study exceeded the pre-defined criteria

for feasibility. Considering that the host department for this research study sees on average 370 patients for an initial hearing assessment per month, more than 200 participants could potentially be recruited per month would recruitment be extended to all adult patients.

The clinic recruitment strategy showed both higher recruitment and retention rates. The majority of participants enrolled in the postal recruitment strategy decided to bring the bIPQ to their appointment but only completed the questionnaire after their appointment. Additionally, participants reported a preference for this recruitment strategy in the telephone follow up.

The sample size for this feasibility study was too small to make inferences about possible differences in illness perception between subjects with presbycusis and more complex forms of hearing loss. Research suggests that illness perceptions differ significantly between different pathologies and that the bIPQ would be sensitive enough to identify these differences [28]. To reduce confounding introduced by heterogeneity in complexity of hearing loss, it is advised to only include subjects with standard presbycusis in a future study.

Treatment choice was recorded for all participants. Only two subjects decided to monitor their hearing loss. We wondered whether this choice might have been influenced by the perception of their hearing loss. Unfortunately, with only two individuals this sample was too limited to make any meaningful inferences. In line with this, the limited variation in recorded treatment choices has further implications for future research. To determine an association between illness perception and treatment choice, a higher variability of treatment choices would be required.

The percentage of subjects deciding to trial hearing aids was surprisingly high [92%] in

comparison to previously reported data [5]. Unlike in other countries, hearing aids are free at the point of care to NHS patients. This difference in financial implications might motivate more patients to trial hearing aids.

The feasibility criteria defined for this study stated that all questionnaire items should be reviewed if two or more participants were unable to complete the respective question. In the Think Aloud analysis 4 of the 5 candidates requested additional instruction regarding the general completion of the bIPQ. No such problems had been reported previously in a similar Think Aloud analysis of the bIPQ [37], which used a “warm-up” task to introduce their participants to the questionnaire and thinking out loud. Furthermore, the remaining participants reported no problems in this regard. It was concluded that this confusion might have been linked to the think Aloud Analysis and the added pressure of being recorded by audiotape.

Two subjects were unable to answer item 2 of the bIPQ adapted for hearing loss. Initially, we suspected that these participants might have suffered from more complex forms of hearing loss with less clear timelines. However, both participants presented with standard presbycusis and were unable to recall difficulties with the respective question at the time of the follow up call. It was therefore decided not to amend or exclude this item from the bIPQ for future research.

Question 5 [illness identity], appeared to be difficult to understand for five participants. Illness identity is commonly described as the label a patient chooses to give to their illness and the symptoms they associate with it [38,39,40]. In case of presbycusis the term “hearing loss” represents both pathology and symptom itself. A similar problem has been reported in a Dutch Think Aloud analysis of the bIPQ [37], where patients were asked to replace the word

“illness” with their musculoskeletal problems. Nevertheless, it has been argued that in the Dutch version this misinterpretation might have been caused by an incorrect translation of the English version of the bIPQ [37].

The more detailed IPQ-R measures illness identity by asking subjects to name symptoms they have experienced since the start of their illness and whether they believe these symptoms to be associated with their illness [38,41]. Freely accessible patient information refers to signs rather than symptoms of hearing loss and mentions examples [7]. It is therefore suggested to change this question to “How much do you experience signs of your hearing loss [e.g. difficulty following conversations; requiring the TV to be turned up in volume; inability to hear the doorbell]?”

Item 7 posed further complications, as some participants were unable to recall the treatment options discussed in the appointment. Furthermore, participants might have associated the term “treatment” with medical care leading to a cure of their hearing loss. It might thus be more appropriate to refer to management options rather than treatment and add suitable examples to item 7. A revised version of this question could be: “How much do you think your management options [e.g. listening tactics, assistive listening devices, hearing aids] are going to help with your hearing loss?”.

The complications noted for Item / further pose the question of how patients’ health literacy influences their coping behavior and their ability to make a shared decision about their future care. In line with NHS standards, all patients should be involved in decisions about their care and give informed consent, if possible. Nevertheless, this assumes that patients are able to

understand and are aware of the different treatment options available and the benefits and limitations of each treatment choice. Meta-analyses showed that reduced health literacy was associated with limited use of health services and poorer treatment outcomes [41].

In conclusion, recruitment and retention rates determined in this study strongly supported feasibility of the ultimate research. The bIPQ provided a comprehensible and acceptable tool to measure illness perceptions in presbycusis patients, which provided highly valuable and variable data at a limited cost and time. There were no anticipated risks or burdens to participants. The researchers strongly support the conduction of the ultimate research study to determine the effects of illness perception on Audiology service usage in presbycusis patients. This study demonstrates that the use of the IPQ is a feasible way to determine patterns of variation in illness perception. The next stage work is required to examine how this illness perception impacts service usage and can inform service delivery

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