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Faculty of Humanities
Department of Speech-Language Pathology and Audiology

SATISFACTION WITH HEARING ASSESSMENT FEEDBACK USING THE MY HEARING EXPLAINED TOOL: CLIENT AND AUDIOLOGIST PERCEPTIONS

by

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(17032416)

In fulfilment of the requirements for the degree **MA Audiology** in the Department of Speech-Language Pathology and Audiology, Faculty of Humanities, University of Pretoria

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ETHICS STATEMENT

The author, whose name appears on this dissertation's title page, has obtained, for the research described in this work, the applicable research ethics approval.

The author declares that she has observed the ethical standards required in the University of Pretoria's Code of ethics for researchers and the Policy guidelines for responsible research.

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ABBREVIATIONS

ASHA	American Speech-Language and Hearing Association
COVID-19	Coronavirus Disease Of 2019
DOI	Digital Object Identifier
IMHET	Ida Institute's My Hearing Explained tool
ICF	International Classification of Functioning
IJA	International Journal of Audiology
ISO	International Organisation of Standardisation
HL	Hearing Loss
HPCSA	Health Professions Council of South Africa
PCC	Person-Centred Care
POPIA	Protection of Personal Information Act
PSQ	Patient Satisfaction Questionnaire
RCT	Randomised Controlled Trial
SD	Standard Deviation
SPSS	Statistical Package of the Social Sciences
UNICEF	United Nations Children's Fund
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHO	World Health Organisation

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PUBLICATIONS AND RESEARCH OUTPUTS

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FORMATTING

This research dissertation used the American Psychological Association (APA) 7th edition referencing style.

The formatting style of chapter three (publication above) may differ from the rest of the document as the journal's format was used to compile the submitted article.

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ABSTRACT

The gold standard of using the audiogram during feedback still follows a more typical medical model where the focus is on current ear pathologies, but it has limited individualisation to clients' communicative needs and preferences. Although the audiogram is a graphical depiction of audiometric results, it remains a complex diagnostic tool. More recently, the Ida Institute's My Hearing Explained tool (*IMHET*) has become available. This study aimed to explore the perceived understanding and satisfaction of assessment feedback using the *IMHET* compared to the audiogram as reported by clients and audiologists.

The first phase of this study was a single-blinded, randomised control trial across five audiology practices including audiologists and clients in the study. After clients received feedback with the audiogram or *IMHET*, the adapted Patient Satisfaction Questionnaire (PSQ) was immediately completed on-site. After a sufficient sample for the control (audiogram) and intervention (*IMHET*) feedback, audiologists completed the PSQ that was adapted to include an open-ended question. Phase two included virtual focus group discussions where one was for clients and the other for audiologists. During these discussions about the *IMHET*, clients and audiologists' perceptions were recorded and analysed thematically.

Audiologists provided feedback to clients using the *IMHET* (n=24) or audiogram (n= 27) during initial hearing assessments. Twenty-one clients (41%) who received feedback with the *IMHET* and seven audiologists completed the open-ended question or participated in focus group discussions.

Satisfaction was not significantly different ($p > 0.05$) between the *IMHET* (76.18; SD = 2.66) or audiogram (75.63; SD=4.73) for the overall PSQ scores reported by clients

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and audiologists. Two shared main themes, understanding and satisfaction, were identified for both tools from the focus groups and open-ended questions. A third main theme, recommendations, was identified only for the *IMHET*.

The *IMHET* is user-friendly, understandable, and valuable as an educational sheet for clients' hearing assessment feedback. Audiologists recommend that the audiogram be used to supplement the *IMHET* to provide frequency-specific feedback. Audiologists have made various recommendations to improve the *IMHET's* clinical use and value for health literacy.

KEYWORDS

Audiogram

Behavioural Measures

Hearing Assessment Feedback

Ida Institute

IDA Tool

My Hearing Explained

Person-Centred Care

Psycho-Social/ Emotional

Satisfaction

Understanding

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CHAPTER 1: INTRODUCTION

As early as the 1970s, there has been a noticeable paradigm shift from the traditional medical model to a biopsychosocial model (Engel, 1977). The American Speech-Language and Hearing Association (ASHA) has recognised that counselling is critical to making this shift (2018). The biopsychosocial model focuses on relatable information showing better information recall and compliance with recommendations (Blom et al., 2019; Levinson et al., 2010; Watermeyer et al., 2012; World Health Organisation [WHO], 2021). In essence, person-centred care (PCC) recognises the client's preferences and provides a platform for them to express their concerns whilst a health provider tailors information according to the context and the clients' needs (English, 2008a; Watermeyer et al., 2012). The recent World Report of Hearing endorsed PCC as the cornerstone to care for an individual's audiological and rehabilitation demands (WHO, 2021). The International Organisation of Standardisation [ISO] (ISO, 2019, 2020) has also prioritised PCC with a standard of practice for client-centred staffing (ISO 22956) with an additional standard focusing on the vocabulary used (ISO 22886) during interactions to ensure a standardised client-care continuum appropriate for all populations.

Hall (2021) encourages a five-step PCC approach to promote a multidisciplinary framework for healthy hearing. Step four of Hall's (2021) approach highlights the importance of individualised counselling to care for clients holistically across their lifespan. Within this continuum, the benefits of effective feedback range from client satisfaction (Margolis, 2004; Zolnierek & DiMatteo, 2009), enhanced decision-making (Chia & Ekladious, 2020), competency to relate information to communication partners (Watermeyer et al., 2012; Blom et al., 2019) and establishing support networks that

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improve outcomes overall (Cherry, 2015). The ability of clients to recall their results and amplification options influence their decision to act on their hearing loss (HL) (Meyer et al., 2011). Communication quality between the audiologist and client directly correlates with information recall (Makaryus & Friedman, 2005). Still, missed PCC opportunities occur due to audiologists' resistance to change, lack of client involvement (Ekberg et al., 2014) and the insufficient individualisation of clients' hearing ability during feedback (Coleman et al., 2018).

The PCC approach encompasses the concepts proposed by the WHO's International Classification of Functioning (ICF) Model of 2007. The ICF builds a long-term partnership with the client, ensuring optimal outcomes through holistic care (Mead & Bower, 2000). This framework includes the client's hearing ability and the shared responsibility and dyad relationship between audiologist and client (Granberg et al., 2014; Mead & Bower, 2000). Similarly, PCC also encourages a biophysiological model that focuses on the client's condition and social-emotional needs (Ekberg et al., 2014; Meyer et al., 2017; Tai et al., 2019).

The gold standard of using the audiogram during feedback still follows a more typical medical model where the focus is on current ear pathologies, but it has limited individualisation to clients' communicative needs and preferences (Gilligan & Weinstein, 2014; Luterman, 2021; Margolis, 2004). The audiogram's diagnostic value is widely accepted, and it remains the focus of audiological assessment feedback (Klyn et al., 2021). However, the intricate nature of the audiogram makes it challenging to understand for clients and even other professionals outside the audiology field, as reflected in the restricted recall of audiologic information (Klyn et al., 2021; Fabry, 2015). Since 1922, the audiogram has been the primary tool to routinely record clinical

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results and counsel clients during feedback (Jerger, 2013). However, Klyn et al. (2019) found that only 60% of recalled information was accurate and only half of the clients reported competency in describing their results to communication partners. Kessels and de Haan (2003) obtained similar findings using the audiogram, which indicated that clients forget 40-80% of the information, and only 50% of information recall was correct. Meyer et al. (2011) accredit limited accuracy and competency of hearing assessment feedback as a prominent contributor to clients lacking acceptance of their hearing ability.

Feedback using the audiogram also has limited efficacy within a biopsychosocial approach if the client cannot engage with the audiologist and understand the language during the interaction (Öhlén et al., 2016). Numerous factors influence client understanding during feedback, specifically considering developing countries where general literacy is limited (Sørensen et al., 2015). Limited health literacy is more common in populations such as the elderly, clients with communication, cognition, neurological or vision disorders, and people with lower socioeconomic statuses (Jahan, 2008; Kindig et al., 2004; Sørensen et al., 2015; United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2017). When considering the benefits mentioned above and the populations at risk for not understanding their hearing ability, it is essential to consider and bridge the health literacy gap in hearing assessment feedback.

The health literacy gap is further broadened by the audiogram's efficacy when used as a counselling tool (Gilligan, 2016; Grenness et al., 2014). When audiologists give feedback with the audiogram, instead of discussing results with clients, audiologists use rote memory (Klein et al., 2011; Watermeyer et al., 2012, 2015) or rely on an

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anatomical explanation and the audiological test battery (English et al., 2016). Audiologists may also deviate from emotional factors as they do not feel equipped to handle the client's uncertainty (Watermeyer et al., 2020). Therefore, the audiogram's gold standard has limited relatability and individualisation to clients' communicative needs and preferences (Gilligan & Weinstein, 2014; Margolis, 2004; Kessels, 2003).

Health literacy can be improved when relatable, culturally, and linguistically sensitive graphical representations are part of audiological protocols (Dowse, 2021; Gilligan & Weinstein, 2014; Nayak et al., 2016; Sorfleet et al., 2009; Watermeyer et al., 2015). Ideally, textual information supplemented with appropriate graphics can increase health literacy from 20% to 80% despite low numerical literacy levels, with the condition that they have a high graphical literacy level (Garcia-Retamero & Cokely, 2013; Galesic & Garcia- Retamero, 2011).

Although the audiogram is a graphical depiction of audiometric results, it remains a diagnostic tool. Its complex nature, including frequency and intensity, limits client comprehension during feedback (Fabry, 2015; Klyn et al., 2021). Alternatively, meticulously designed visual counselling material that is evidence-based and reinforced with written information can express concepts in a meaningful way to various populations (Cherry, 2015). The same author (Cherry, 2015) stated that health educational material presented familiarly could empower the client, encourage reflection, relate information to communication partners, and establish support networks that later impact compliance with interventions.

The development of several initiatives to simplify hearing assessment feedback was developed as the audiogram relates to functional hearing deficits (Gilligan, 2016). The widely used *Speech Banana* is superimposed over the audiogram, depicting individual

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phonemes at a conversational level (Ross, 2004). A quantifiable alternative to the *Speech Banana* is the *Speech Intelligibility Index*. The *Speech Intelligibility Index* indicates the perception of functionally perceived speech within quiet instead of realistic noise within daily functioning (Hornsby, 2004). The resource has led to the misperception of clients asking the amount of residual hearing they may have (Hornsby, 2004). The issue with these derivatives is that although the audiogram is simplified, it is still complex, and the *Speech Banana* is currently limited to non-tonal languages (Klangpornkun et al., 2013). The only non-tonal languages accommodated with the *Speech Banana* are Mandarin and Chinese (Hu et al., 2019; Klangpornkun et al., 2013). Nevertheless, educational sheets and alternative tools remain beneficial due to the simple language alternatives used to describe HL and relate it to its functional impact on the perception and understanding of sounds (Gilligan, 2016).

Klyn et al. (2021) state the need for a succinct and straightforward summary of the audiogram like other tools used to explain blood pressure or vision (i.e., 20/20). More recently, the Ida Institute's My Hearing Explained tool (*IMHET*) (Appendix A) has become available and aims to individualise feedback, improve clients' comprehension of their hearing ability, and relate it to their aspirations for their hearing lifestyle (Ida Institute, 2021a). The *IMHET* infographic is a conversational guide that uses primary language ("*Brain Energy, Volume, Clarity*") related to hearing ability to explain the audiogram's contents (Ida Institute, 2021a). In a recent informal survey conducted by Klyn and colleagues (2019), 83% of hearing healthcare professionals indicated that they nearly always showed the client the audiogram in the consultation. In 2018, clients and 99% of consulted clinicians were interested in utilising a new resource due to the audiogram's limitations (McLean, 2019).

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The tool follows a strength-based perspective by empowering clients to advocate for themselves when informed of their hearing ability in a relatable manner and following principles of good information sharing (Blom et al., 2019; Ida Institute, 2021a). The *IMHET* is centred around an illustrated head, surrounded by icons, and utilises universal imagery (circled and triangles) to familiarise their hearing rehabilitation information (Ida Institute, 2021a). Audiologists prompt clients to self-report, rate their listening effort and recall their hearing management knowledge for individualised recommendations (Ida Institute, 2021a; 2021b; 2021c).

The status quo for providing hearing assessment feedback and counselling using the audiogram has contributed to one-way interactions with clients and generalised intervention recommendations typical of hearing assessment feedback (English, 2008b; Von Hapsburg & Lauristen, 2012; Watermeyer, 2020). Audiologists and their clients should actively engage in a holistic, multifarious process to effectively provide hearing assessment feedback (Grenness et al., 2014; Von Hapsburg & Lauristen, 2012; Watermeyer et al., 2012, 2020). The *IMHET* aims to mitigate the ambiguity of feedback and limit unnecessary information overall (McLean, 2019). Consequently, this study aimed to investigate the perceived understanding and satisfaction of the *IMHET* compared to the standard audiogram experienced by clients and audiologists during hearing assessment feedback.

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CHAPTER 2: METHODOLOGY

2.1 RESEARCH AIMS

The study aimed to explore the perceived understanding and satisfaction of the *IMHET* (Appendix A) compared to the standard audiogram by clients and audiologists when providing hearing assessment feedback.

2.2. ETHICAL CONSIDERATIONS

The study received approval from the Faculty of Humanities research ethics committee (Appendix B) (HUM011/1220). The South African National Health Act (2007) and the United Nations Children's Fund (UNICEF) (2014) guidelines for randomised controlled trials (RCT) stipulates that health care researchers must protect humans' wellbeing and rights. UNICEF (2014) particularly recognises the experimental nature of RCTs and emphasises the continuous consideration of acting in a beneficent manner when making decisions. Hence, Batho Pele Principles (1997) and ethical guidelines from the South African National Health Act (2007) and UNICEF (2014) are in Table 1.

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Table 1: Ethical considerations for this research project (Leedy & Ormrod, 2016)

Principle	Adapted Application to the Study
The researcher needed to clearly state the study's objective and inform client and audiologist participants comprehensively about the procedure. Informed consent was upheld by communicating the objective in a familiar language at an appropriate literacy level.	Informed consent forms were written in English ensuring comprehension before private practice owners and their audiologists gave voluntary written consent to participate in the study. Audiologists' (Appendix C) and clients' (Appendix D) informed consent described the nature of the study and the roles if they voluntary choose to participate in the RCT and focus groups. Client participants were aware of the study's aim (effectiveness of the feedback method) when reading the informed consent document. Clients who have experienced the IMHET (Appendix A) and consented to participate in the RCT stipulated interest in participating in the focus groups.
The health establishment had to provide written permission for the researcher to perform the research project.	The researcher approached eligible practices for the study, where study procedures and questions were clarified as necessary. By signing informed consent documents (Appendix C) before the study commenced, owners and managers gave permission for the study to include the private practices audiologists and clients as participants.
Disclosing participant information and perceptions is only permissible after written informed consent. However, it is prohibited for the researcher to report identifying information to respect participants' privacy.	After individual client and audiologist participants provided informed consent (Appendix C and D), their data was made part of the analysis and then disclosed in the final article. For phase one, any information that discloses the identification of client and audiologist participants was not recorded and was removed from analysis to maintain confidentiality and anonymity in adherence to the Protection of Personal Information Act (POPIA) (2021) (Leedy & Omrod, 2016). The researcher directly communicated with the audiologist and client participants, reducing the anonymity in phase two. Instead, this confidentiality and anonymity were upheld by not naming participants (clients nor audiologists) in the written text. An alphanumeric code was assigned per client and audiologist participant and recorded during the data collection and analysis.
The researcher was responsible for preventing unapproved access to health care records by implementing security measures.	Dropbox™ (San Francisco, CA, USA) and security passwords safeguard the data from unwanted access. On completion of the study, data (recordings, transcripts, and questionnaires) were stored and secured in digital and hardcopy at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for 15 years for research and archiving purposes. Considering that the study happened in South Africa, the researcher complied with the National Research Foundation regulations and the POPIA (2021) by following the procedures and considerations. The POPIA (2021) specifies that clients need to consent to release their contact details to the researcher for arranging an appropriate time to meet and have focus groups. The International Journal of Audiology (IJA) has

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Principle	Adapted Application to the Study
	allocated a digital object identifier (DOI) (10.1080/14992027.2022.2053595) upon acceptance of the article for public access.
The researcher had to comply with the health establishment's (private practices) rules.	The researcher respected the facility's regulations and protocols and only included practices eligible for participation who only used the audiogram during feedback and no other derivatives. Representing the University of Pretoria, the researcher upheld a standard of behaviour.
All client and audiologist participants' rights, safety, and well-being must be prioritised and not compromised over society and researchers' interests (Leedy & Omrod, 2016). The study could only be conducted because the benefits were motivated to be of more value despite the risks involved.	The social benefit of the *IMHET* (Appendix A) was that clients comprehended their hearing ability results. Furthermore, the study had no disadvantage as the control group still received feedback that was the present gold-standard tool (standard audiogram) to explain the client's hearing ability. Nevertheless, the simple random sampling and random assignment of trial arms were transparent. The process was explained in the informed consent forms (Appendix C and D) to reduce apprehension between the control and intervention groups. Moreover, considering the Covid-19 pandemic, strict infection control measures were taken. • The researcher, audiologists, and client participants were required to wear masks, face shields and adhere to the social distancing rule (at the time, March-August 2021) • Alternatively, online platforms were used (Swanepoel & Hall, 2020).

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2.3. RESEARCH DESIGN

The study followed an RCT using an experimental design as the efficacy of each trial arm (*IMHET* and audiogram), and a reliable cause-effect relationship with PCC was measured (Brink et al., 2018). This cross-sectional study used a mixed-method dominant quantitative and less-dominant qualitative design for six months (Kansteiner & Konig, 2020) (Figure 1).

The quantitative component and first phase constituted a single-blinded, pragmatic RCT where the perceptions of the *IMHET* (Appendix A) were compared to the audiogram using the adapted Patient Satisfaction Questionnaire (PSQ) (Marshall & Hayes, 1994) (Appendix E and Appendix F). The second phase included a qualitative component to understand the clients and audiologist participants' subjective experience during focus groups and to determine the level of agreement with the numeric data from the RCT (Kansteiner & Konig, 2020). This component used content analysis to identify client and audiologist participants' perceptions (Brink et al., 2018; Cresswell et al., 2003). Concurrent triangulation-maintained credibility through data triangulation (questionnaires, focus groups for clients and audiologists) and methodological triangulation (qualitative and quantitative).

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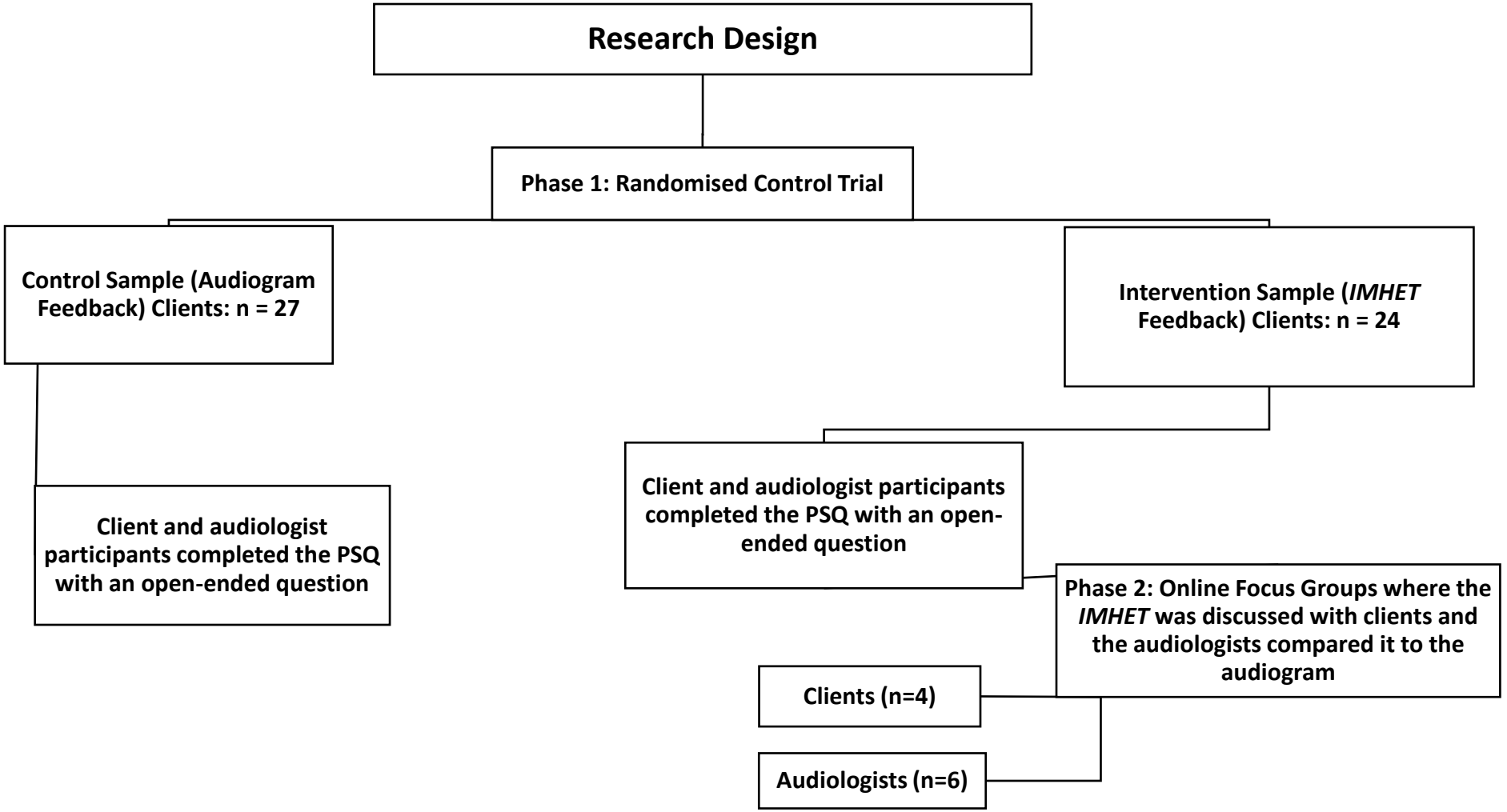

Figure 1: An outline of the research design followed

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2.4. STUDY PARTICIPANTS AND SELECTION CRITERIA

A priori-power analysis indicated a minimum of 18 clients per group for phase one to achieve a power of at least 0.8. The first consecutive 27 clients (control group) received feedback from the audiogram. The second intervention group of 24 clients received feedback using only the *IMHET* (Appendix A).

The researcher contacted 13 private audiology practices across Gauteng. Audiologists had to give feedback in English, routinely using the audiogram. No previous knowledge of *IMHET* (Appendix A) was a criterion to avoid bias and ensure consistency. The audiologists had to be registered with the Health Professions Council of South Africa (HPCSA) as independent practitioners and have more than two years of working experience. Five practises and seven audiologists working at the practices consented (Appendix C) to participate in the study.

2.4.1. Phase One: RCT

Adult clients, who were 18 years and older and attended their initial audiological evaluation, were informed of the study (Appendix D) and, through randomized sampling, were recruited by the audiologists across the respective practices. Audiologists confirmed a history of no previous audiological evaluation before recruiting client participants. The first recruited group of clients received feedback with the audiogram, and the second group of clients who entered the practices received feedback with the *IMHET*. Each client participant in the sampling frame had a fair and equal chance of being included (Brink et al., 2018). For this reason, the client demographics (Table 2) represent the location of each practice and the population group in that area (Audiology practices located in urban areas receive clients with higher education levels).

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Table 2: Client demographics for the control and intervention group

		Audiogram	*IMHET*	Total
Gender	Male	17	13	30
	Female	9	11	20
	No Response	1	0	1
Education	Primary Education	0	0	0
	Secondary Education	5	7	12
	Tertiary Education	21	17	38
	No Response	1	0	1
Area	Rural	6	1	7
	Urban	20	23	43
	No Response	1	0	1

Table three stipulates the inclusion and exclusion criteria used to select client participants for phases one and two of the study. The inclusion criteria ensured that all client participants had the same baseline experience with hearing assessment feedback and a fair understanding of the results.

Table 3: Inclusion criteria for clients in each phase of the study

Phase One: RCT		
Characteristic	**Description**	**Rationale**
Full Diagnostic Test Battery	Adult clients of any gender attending their initial diagnostic appointment were eligible. The hearing assessment required otoscopy, tympanometry, acoustic reflexes, pure tones (air conduction and bone conduction), and speech audiometry.	The audiologist had to conduct a full test battery to provide comprehensive feedback on the client's hearing ability.
Hearing Loss (HL)	Client participants also had to have a HL (bilateral, unilateral, asymmetric, or symmetric sensorineural, mixed, or conductive) ranging from mild to profound according to Swanepoel & Laurent's norms (2013).	The *IMHET* was explicitly designed for clients with a HL. This study addressed this population by explaining a client's hearing ability when a HL was involved.

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Phase One: RCT		
Characteristic	**Description**	**Rationale**
Speak and understand English	Clients and audiologists needed to be first or second language users of English to ensure that both parties in the dyad relationship can converse effectively. English proficiency was also necessary for client participants to understand the feedback and complete the questionnaire (PSQ) competently.	Clients were expected to communicate with the audiologists to understand their hearing ability and clarify informed consent or questions about the hearing assessment feedback.
Respond Reliably to Unaided Pure Tone Audiometry	Clients were only included if they could reliably respond to pure tones for the audiologist to determine an accurate reflection of their hearing ability.	Audiologists tested clients to quantify the HL and ensure that the information communicated during feedback was accurate. Pure tone responses had to be unaided as the *IMHET* were about the client's hearing ability, not amplification benefit.
Cognitive Ability	Participation was prohibited if a third party self-reported a significant cognitive impairment such as Dementia or Alzheimer's. If present at the hearing assessment, this report had to be self-reported or by a third party.	Clients with cognitive impairments were unable to understand and rate their satisfaction reliably. Katz (2015) states that typical cognitive ability can be assumed if clients come for their initial hearing assessment as a form of self-help.
Phase Two: Focus Group Discussions		
Characteristic	**Description**	**Rationale**
Technological Device and Accessible, Stable Internet Connection	These clients were only eligible to contribute to the focus groups (for phase two) if they had a technological device and accessible internet connection.	Client and audiologist participants interacted online during the COVID-19 pandemic and regulations, adhering to social distancing.

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2.4.2. Phase Two: Qualitative exploration of participants' perceptions

Only phase one clients who provided informed consent (Appendix D) and received feedback from the *IMHET* were contacted during the recruitment process. Four clients participated in the focus group discussion of the 24 adult participants who received feedback using the *IMHET*. Four audiologists out of the seven who participated in phase one also participated in the focus group.

2.5. EQUIPMENT, APPARATUS AND MATERIALS

The following equipment, apparatus and materials were utilised in the study during the data collection period.

2.5.1. Feedback Tools: Standard Audiogram and IMHET (Appendix A)

Audiologists used the standard audiogram as the control feedback tool. The outcomes of the audiogram were compared against the outcomes of the *IMHET* (intervention tool) (Appendix A).

2.5.2. Questionnaires: PSQ (Appendix E and F)

The study consists of two subjective measures. The first subjective measure was a self-report of client participants' perceived understanding of their hearing ability and satisfaction with the hearing assessment feedback method using the adapted PSQ (Appendix E) (Marshall & Hays, 1994). The PSQ was originally designed to monitor the quality of medical care. The PSQ gained popularity when more positive outcomes were reported with patient satisfaction (Marshall & Hays, 1994). The PSQ has been validated and deemed reliable by several studies (Thayaparan and Mahdi, 2013; Nordyke et al., 2006; Hagedoorn et al., 2003; Grogan et al., 2000). Client participants completed the printed adapted PSQ (Marshall & Hays, 1994) (Appendix E) immediately, on-site after their initial hearing assessment feedback. Similarly, after

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providing feedback with the standard audiogram (n=7) and the *IMHET* (n=6) on-site, each audiologist completed an adapted PSQ (Appendix E and F) (Marshall & Hays, 1994).

The adapted version of the PSQs excluded the sub-section on "*Financial Aspects*" as the study focused on clients' and audiologists' perceptions of the feedback method provided and not the financial criteria. For this reason, the overall satisfaction score was not comparable to the norms of other studies. The PSQ included 16 questions with six sub-sections: "*General Satisfaction, Technical Quality, Interpersonal Manner, Communication, Time Spent with the Audiologist, Accessibility",* and *"Convenience*" (Marshall & Hays, 1994). The five-point Likert scale ranged from strongly disagree (scored one) to agree (score five) strongly. Questions four, eight, ten, eleven, fourteen and fifteen was negatively phrased thus the scoring was reversed to determine the final score as outlined by Marshall & Hays (1994). In addition to the PSQ (Appendix E and F), the open-ended question allowed the clinicians more time to report their perceptions but pressured clients during their hearing consultation time.

Client participants completed the adapted PSQ immediately after feedback about their hearing ability. Audiologist participants were requested to complete the adapted PSQ after participating in each trial arm of the study. The PSQ was printed out to have the convenience of overcoming technological barriers but has the disadvantage that it was completed on-site in that the audiologist's presence may bias clients' perceptions.

2.5.3. Interview Guide (Appendix G and H)

The second phase's subjective measure was a qualitative component that involved two virtual focus groups. The interview guides compared the *IMHET* (Appendix A) to

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the audiogram and determined the satisfaction and benefits of the *IMHET* for clients (Appendix G) and audiologists (Appendix H).

2.5.4. Zoom™ & Dropbox™

Focus group discussions were conducted online and recorded using this platform. Zoom™ (San Jose, CA, USA) allowed adherence to Covid-19 social distancing restrictions and ensured the health and safety of client and audiologist participants. All data (recordings, transcripts, and questionnaires) were stored electronically using a password-protected Dropbox™ (San Francisco, CA, USA) application.

2.6. DATA COLLECTION PROCEDURES

2.6.1. Phase One – RCT

Eligible client participants signed the informed consent document (Appendix D) before their routine hearing assessment at an audiology practice. Client participants were also aware of the single-blinded randomisation related to the feedback method (White et al., 2014). If consent was not provided, the client was not included in the study and received feedback using the audiogram, the current standard feedback method in practice. All client participants underwent a comprehensive hearing assessment to evaluate their hearing, ranging from 30 minutes to an hour. Both feedback methods took at most 15 minutes and completing the PSQ took two to five minutes.

Audiologists did not receive training regarding feedback with the audiogram since it was the standard feedback method in practice. Hence, they were aware of the allocated feedback method, unlike the client participants. Differences in the trial arms thus result from the feedback method allocated and not from participant characteristics, therefore, controlling possible confounding variables (Polit & Beck,

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2017). The first recruited group (feedback with the standard audiogram; n=27) was the control group so that the audiologists were unbiased by the *IMHET* training.

Before the second feedback method commenced, all audiologists received virtual training on the *IMHET* (Appendix A). Training included the provision of an *original IMHET* (Appendix A). A video of the introduction and application of the *IMHET*, available on the IDA institute website, was also provided (Ida Institute, 2021b; Ida Institute, 2021c). The proficiency of the *IMHET* was self-reported, and questions were clarified via elective communication.

The Ida Institute's formal guidelines (2021b) on using the *IMHET* were followed. Prerequisites such as case history, hearing and speech tests were explained before providing a practical conversation example (Ida Institute, 2021c). An example of completing the one-page handout was also given (Ida Institute, 2021c).

2.6.2. Phase Two: Qualitative exploration of participants' perceptions

The second phase's subjective measure was a qualitative component that involved two virtual focus groups (Appendix G and H). A non-compulsory, open-ended question at the end of the PSQ (Appendix E and F) also explored participants' perceptions (clients and audiologists) who received feedback using the *IMHET (Describe how the feedback method contributed to understanding your hearing ability)*. Clients (*n* = 21) and audiologists (*n* = 7) completed this open-ended question (Appendix E and F) to record their perceptions with the audiogram or *IMHET* (Appendix A) for hearing assessment feedback. Clients (*n* = 4) who received feedback using the *IMHET* (Appendix A) described their perceptions and value of the tool in their focus groups. In the focus group for the audiologists, the audiologist participants described and

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compared the audiogram to the *IMHET* (Appendix A); whilst discussing the value and perceptions of the *IMHET.*

The researcher facilitated an online, synchronous focus groups (Appendix G and H) over Zoom™ (San Jose, CA, USA). The chat function was disabled to maintain the benefit of visual and auditory cues and to elicit spontaneous and natural reactions from client and audiologist participants (Carey, 2016). Participants joined virtual focus groups in a quiet room with minimal distractions and their cameras to be on to maintain face-to-face contact (Brink et al., 2018). The semi-structured focus groups constituted an interview guide of three main questions for client participants (Appendix H) whose hearing had been assessed and four main questions for the audiologist participants (Appendix H) who conducted the hearing assessments that took less than an hour.

Contacted client participants confirmed consent (Appendix D) and arranged an appropriate meeting time within one to two weeks after the cessation of phase one. Four out of six audiologists were also included in the second focus group to obtain their perceptions of the *IMHET* (Appendix A) compared to the audiogram. One audiologist could not implement the tool due to COVID-19 circumstances; hence her perception of the audiogram was only recorded.

All data were video-recorded and transcribed verbatim (including (non)-verbal communication) onto a password-protected computer database (Dropbox™) from forms/spoken/ written (notes) and recordings. Group dynamics, including body language, communication approaches, and gestures, were noted to add rich detail to textual data. (Watermeyer et al., 2012)

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2.7. DATA ANALYSIS

All data from the first phase were analysed using the Statistical Package of the Social Sciences [SPSS] (SPSS v.27.0; IBM, 2020). The following tests identified the differences between two independent groups: (i) Descriptive statistics, (ii) Normality tests (Shapiro-Wilk) and the (iii) Mann-Whitney test. The power analysis conducted using the G*Power software (v.3.1.9.4; Faul et al., 2007) was the only exception to determine the sampling size needed. Scales were created for the Cronbach alpha values above 0.6 for the following continuous variables: "*Technical Quality, Accessibility and Convenience, Interpersonal Manner*", and "*Time Spent with Provider*". The categorical variables, "*Communication*" and "*General Satisfaction*", were analysed individually.

All client and audiologist participants and semi-structured interview transcripts were anonymised. Themes were identified by following Creswell's (2002) guidelines to code for inductive content analysis (Knudsen et al., 2012; Graneheim & Lundman, 2004). The benefit of this analysis approach was that raw data were condensed whilst relating to the aim of the study, consequently identifying relevant themes of all participants' perceptions (Thomas, 2003). Clients' and audiologists' data were triangulated from questionnaires and focus groups. The authors verified the results, interpreted, discussed the dataset, and generated new codes until data saturation and inconsistencies were resolved.

2.8. RELIABILITY AND VALIDITY

The meticulousness of the research process and the success of drawing meaningful conclusions from research data significantly influenced the reliability and validity of the measurement tools (Heale & Twycross, 2015; Leedy & Ormrod, 2010). Consistent and

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repeatable measurements establish reliability (De Vos et al., 2021). Essentially, validity is where an instrument or, in the case of this study, a questionnaire measures or meets the objectives as prescribed (De Vos et al., 2021).

This study warranted reliability and validity in the following ways:

- The adapted PSQ for client participants (Appendix E) and audiologist participants (Appendix F) was based on the original, validated (precise level of measurement), and reliable questionnaire as was determined by Marshall & Hays (1994) and several other studies (Thayaparan and Mahdi, 2013; Nordyke et al., 2006; Hagedoorn et al., 2003; Grogan et al., 2000).
- Adapting the original PSQ (Marshall & Hays, 1994) and removing irrelevant categories ensured validity.
- Participants (client and audiologists) from each phase received the same questionnaire to ensure a fair comparison between the control (standard audiogram) and intervention (*IMHET*) groups.
- Audiologists underwent training, self-reported proficiency, and an opportunity was given to clarify questions about the new tool to reduce tester error.
- The audiologists had to be registered with the HPCSA as independent practitioners and have more than two years of working experience. This criterion ensures a certain standard of competency, skill, and experience (Hahn, 2014) for the audiologists to provide valid and reliable perceptions of the tools.
- Transparency was adhered to by randomly assigning trial arms for each consecutive and subsequent client that entered the respective practices. To further reduce bias for clients and audiologists, the first 27 recruited clients

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received feedback with the audiogram; the subsequent 24 recruited clients who consented received feedback with *IMHET*.

- Booth & Tannock (2014) state that RCTs are scientifically significant because they have high internal validity caused by randomisation. Despite clients not being randomised regarding demographics, the control and intervention groups were similar, allowing the differences between trial arms based on the feedback method.
- Non-identifying data encouraged client and audiologist participants to honestly answer the PSQ (Appendix E and F), enhancing the validity of the data obtained.
- Data and method triangulation maintain the credibility of the qualitative results (Korstjens & Moser, 2018). Client and audiologist participant groups joined the discussion in a quiet room to ensure reliable and valid responses with minimal distractions. Similarly, the study upholds credibility as prolonged engagement during the focus groups-built trust between the interviewer and participants (Korstjens & Moser, 2018). Cross-checking and confirmation data ensured transferability (Korstjens & Moser, 2018), rigorousness, and reliable conclusions drawn from a single source.
- The only factors that may influence the validity and reliability of the results were that the questionnaires were answered on-site in the presence of the audiologists. In the presence of an audiologist or the person whose feedback method the client may be rating, the results may favour the clinician with higher satisfaction.

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- The *IMHET's* qualitative data constituted of an open-ended question and focus groups. Ensuring a fair comparison, the audiogram had qualitative data in the open-ended questions and audiologists also mentioned it in the focus groups.

The study reduced bias in the following ways:

- No previous knowledge of *IMHET* (Appendix A) was a criterion when sampling audiologists to avoid bias and ensure consistency.
- On the condition of sufficient data collection with the audiogram, audiologists underwent training to avoid bias of the *IMHET* training and maintain a fair baseline with the PSQ.
- Randomisation reduced sampling bias. Single blinding reduced the client's bias towards a specific tool as the control/ intervention feedback was unknown to the audiologists.
- The same audiologists participated throughout the study, ensuring internal consistency.

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CHAPTER 3: RESEARCH ARTICLE

Satisfaction with hearing assessment feedback using the My Hearing Explained tool: client and audiologist perceptions

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3.1. ABSTRACT

Objective: To determine the perceived satisfaction and understanding of hearing assessment feedback using the Ida My Hearing Explained Tool (*IMHET*), compared to the standard audiogram reported by adult clients and audiologists.

Design: This study is a mixed-method design comparing clients' and audiologists' perceptions through a single-blinded, randomised control trial and focus group discussions. After using either the audiogram or *IMHET* for feedback, clients and audiologists completed the adapted Patient Satisfaction Questionnaire (PSQ).

Study Sample: Audiologists provided hearing assessment feedback (Total= 51) using the *IMHET* or audiogram) during the client's initial audiological consultations. Twenty-

[1] *Note: The manuscript followed the editorial specifications of the journal and may differ from the editorial style of the rest of the dissertation.*

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seven clients and seven audiologists participated in focus groups or open-ended questions**.**

Results: Satisfaction was not significantly different ($p > 0.05$) between the *IMHET* (76.18; SD: 2.66) or audiogram (75.63; SD: 4.73) for the overall PSQ scores reported by clients and audiologists. Two shared main themes, understanding and satisfaction, were identified for both tools from the focus groups and open-ended questions. A third main theme, recommendations, was identified only for the *IMHET*.

Conclusions: The *IMHET* is a valuable resource for clients during hearing assessment feedback. Audiologists recommend that the audiogram be used as a supplement when using the *IMHET* to provide feedback.

Keywords: Audiogram, Behavioural Measures, Hearing Assessment Feedback, IDA Tool, My Hearing Explained, Psycho-Social/ Emotional, Perceptions, Person-Centred Care

Abbreviations: Ida Institute's My Hearing Explained tool =*IMHET*, PCC= Person-Centred Care, PSQ = Patient Satisfaction Questionnaire, SD= Standard Deviation, WHO= World Health Organisation

3.2. INTRODUCTION

The most recent *World Report Hearing* endorses integrated, person-centred care (PCC) as the cornerstone for an individual's audiological and rehabilitation demands. Individualising and simplifying health professional feedback are paramount across the lifespan of clients (World Health Organisation (WHO) 2021). Still, missed PCC opportunities occur with traditional feedback protocols remaining, resulting in a lack of client involvement and resistance to change when explaining clients' hearing ability during feedback (Ekberg et al. 2020).

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Since 1922, the audiogram has been the primary tool to routinely record clinical results and counsel clients during feedback (Jerger 2013). The gold standard of using the audiogram during feedback still predominantly follows a medical model, focusing on the technical aspects of hearing loss and limiting individualisation to clients' communicative needs and preferences (Luterman 2021; Ekberg et al. 2020; Tai et al. 2019; Kessels & De Haan 2003). The audiogram's diagnostic value is undeniable as it is ubiquitous among audiologists (Klyn et al. 2021). However, the intricate nature of the audiogram makes it challenging to understand and recall audiologic information for audiologists, clients, and even other professionals outside the audiology field (Klyn et al. 2021; Fabry 2015). Klyn and colleagues (2019) found that only 60% of recalled information was accurate and only half of the clients reported competency in describing their results to communication partners (Klyn et al. 2019). Kessels and De Haan (2003) obtained similar findings using the audiogram, which indicated that clients forget 40-80% of the information, and only 50% of information recall was correct.

Employing the audiogram as the standard hearing assessment feedback tool typically relies on rote memory rather than discussing and individualising results with clients (Gilligan, 2016; Watermeyer et al. 2015; Grenness et al. 2014; Watermeyer et al. 2012; Klein et al. 2011; Ross 2004). The clinician may overwhelm clients with unnecessary information, increasing uncertainty and reducing comprehension (Watermeyer et al. 2012; 2015; 2020). Feedback using the audiogram also has limited efficacy if the client cannot engage with the audiologist and fully understand the language during the interaction (Öhlén et al. 2016). The health literacy barrier can be mitigated when relatable, culturally, and linguistically sensitive graphical representations are part of hearing assessment feedback (Dowse 2021; Nayak et al. 2016; Watermeyer et al. 2015).

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Ideally, textual information supplemented with appropriate graphics can increase health literacy from 20% to 80% despite low numerical literacy levels, on the condition that they have a high graphical literacy level (Garcia-Retamero & Cokely 2017). Although the audiogram is a graphical depiction of audiometric results, it remains a complex technical representation that may limit a client's comprehension during feedback (Klyn et al. 2021; Fabry 2015). Considering these factors, meticulously designed visual counselling material that is evidence-based and reinforced with written information can express concepts in a meaningful and easily understandable way to various populations (Garcia-Retamero and Cokely 2017).

Several feasible initiatives to simplify assessment feedback include the *Speech Banana* and the *Speech Intelligibility Index*. These initiatives apply the principle that non-professionals will understand the audiogram when using familiar sounds or associating it with speech. The *Speech Banana* superimposes the audiogram depicting individual phonemes at a conversational level (Ross 2004). Ross (2004), however, has criticised this tool for its static nature, as typical conversation varies, and phonemes are not naturally perceived individually. Consonant and vowel cues increase clients' understanding of speech compared to what the audiogram records within quiet and isolated pure tones (Ross 2004). There are efforts to make the *Speech Banana* accessible to tonal languages, but not all languages have been included (Hu et al. 2019). A quantifiable alternative to the *Speech Banana* is the *Speech Intelligibility Index* which indicates the perception of functionally perceived speech within quiet instead of realistic noise within daily life. The *Speech Intelligibility Index* has also led to the misperception of clients asking the amount of residual hearing they may have (Hornsby 2004). The issue with these derivatives is that although the audiogram is simplified, it is still complex (Klyn et al. 2021). Nevertheless, educational sheets and

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alternative tools may still be beneficial due to the simple language alternatives used to describe hearing loss and relate it to its functional impact on the perception of sounds (Gilligan 2016).

More recently, the Ida Institute's My Hearing Explained tool (*IMHET*) has become available. *IMHET* aims to individualise feedback, improve clients' comprehension of their hearing ability, and relate it to their aspirations for their hearing lifestyle (Ida Institute 2021a). The *IMHET* infographic is a conversational guide that uses basic language (e.g., "*Brain Energy, Loudness*" and "*Clarity*") related to hearing ability to explain the audiogram's contents (Ida Institute 2021a). The *IMHET* follows a strength-based perspective by empowering clients to advocate for themselves when informed of their hearing ability in a relatable manner and following principles of good information sharing (Ida Institute 2021a; Blom et al. 2019). The colourful *IMHET* is centred around an illustrated head, surrounded by icons in warm tones (red and orange), and applies universal imagery (circled and triangles) to familiarise clients with hearing rehabilitation information (Ida Institute 2021a). Audiologists prompt clients throughout the initial session to self-report, rate their listening effort and recall their knowledge of hearing management for individualised recommendations (Ida Institute 2021a; 2021b).

Audiologists and their clients must actively engage in a holistic, multifarious process to effectively provide hearing assessment feedback (Watermeyer et al. 2020; 2012; Grenness et al. 2014). Watermeyer (2020) notes the need to limit unnecessary information and mitigate ambiguity of audiological feedback, which the *IMHET* aims to address (Blom et al. 2019). Consequently, the objective of this study was to explore the perceived understanding and satisfaction of assessment feedback using the *IMHET* compared to the audiogram as reported by clients and audiologists.

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3.3. MATERIALS AND METHODS

Approval from the relevant institutional review board (HUM011/1220) was received. Before data collection, both participant groups provided written informed consent.

3.3.1. Study design

The study followed a mixed-method design. For the quantitative component, phase one constituted two groups of adult clients for the single-blinded, randomised control trial. Across participating audiology practices, a consecutive group of eligible adult clients attending their first hearing consultation received the audiogram (control) feedback. The second group of eligible adult clients received feedback with the intervention (*IMHET*) method. The qualitative component in phase two constituted two focus groups divided between clients and audiologists.

3.3.2. Participants (Clients and Audiologists)

Five audiology practices with seven audiologists, who routinely used the audiogram during feedback and had no prior knowledge of the *IMHET*, were included. Audiologists had to be registered with the Health Professions Council of South Africa and have more than two years of working experience. This inclusion criterion ensured competency and experience in hearing assessment feedback with the audiogram. All audiologists were female, bilingual and four out of the seven had postgraduate qualifications.

Clients who were 18 years and older and attended their first hearing assessment were informed of the study and recruited by the audiologists at the respective practices. Twenty-seven clients received the audiogram (control) feedback, and 24 received the *IMHET* (intervention) feedback. Most participants were male (n = 31). One participant did not disclose gender or education. Thirty-nine client participants (83%) reported

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having a tertiary level of education, and only 11 client participants had secondary education.

Audiometric assessments comprised otoscopy, tympanometry, pure tone, and speech audiometry. Clients had to have hearing loss, speak, and understand English and respond reliably to pure tone stimuli. Clients were excluded from the study if they had a significant cognitive impairment (i.e., Dementia or Alzheimer's). Clients receiving feedback with *IMHET* in phase one initially indicated their consent to participate in focus groups for phase two when approached to participate in the study. Client and audiologist were only eligible to contribute to the focus groups if they had a technological device with an accessible internet connection and received feedback through *IMHET*.

3.3.3. Data Collection Materials and Procedures

Audiologists in this study did not receive any training regarding feedback using the audiogram since it is standard practice. Audiologists only received training regarding the *IMHET* after the control group (audiogram) ended and before the intervention (*IMHET*) group commenced. Training included the provision of an original *IMHET* and a video of the introduction and application thereof, available on the IDA institute website (Ida Institute 2021a; Ida Institute 2021b). Proficiency of the *IMHET* was self-reported, and questions were clarified via elective communication.

In the first phase of the study, participants' feedback experiences and satisfaction with the *IMHET* and audiogram were reported using an adapted version of the standardised and validated "Patient Satisfaction Questionnaire" (PSQ) (Marshall & Hays 1994) (Appendix E and F). Critical revision and statistical reviews determined the reliability and validity of the adapted PSQ. The adapted version excluded the sub-section on

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"*Financial Aspect*s" as it is unrelated to the aim of this study, where satisfaction and understanding of the feedback tools were the focus. For this reason, the overall satisfaction score is lower compared to other studies and incomparable to norms. The PSQ included 16 items with the following six sub-sections: "*General Satisfaction, Technical Quality, Interpersonal Manner, Communication, Time Spent with the Audiologist, Accessibility and Convenience*" (Marshall & Hays 1994). Each sub-section had between two to four items where clients rated their satisfaction on the five-point Likert scale ranging from strongly disagree (scored one) to agree (score five) strongly. Client satisfaction increased as the PSQ total score increased.

For both the audiogram and *IMHET*, a non-compulsory open-ended question was included at the end of the questionnaire. (*Describe how the feedback method contributed to understanding your hearing ability).* With the open-ended questions, six audiologists gave their opinion regarding the value of the audiogram and *IMHET*. It allowed the clinicians to complete the question in more time. After feedback using either tool, each client completed the adapted PSQ on-site (Marshall & Hays 1994). Similarly, after providing feedback with the audiogram and the *IMHET* on-site, every audiologist completed an adapted PSQ to record their perceptions of each feedback method. One audiologist could not implement the *IMHET* due to COVID-19 lockdown regulations; hence only her perception of the audiogram was recorded.

The second phase was a qualitative exploration of participants' perceptions (clients and audiologists) who received feedback using the audiogram or *IMHET* with an open-ended question or focus groups. The first focus group was with clients who have received feedback using the *IMHET*; the second was with audiologists who participated in phase one. Client and audiologist participants were contacted to obtain consent and arrange an appropriate meeting time two weeks after the cessation of

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phase one. The researcher facilitated the semi-structured, online, synchronous focus groups over Zoom™ (San Jose, CA, USA), video-recorded and transcribed verbatim, whilst accounting for body language, e.g., nodding (Watermeyer et al. 2012).

3.3.4. Analysis

The first phase was analysed with the Statistical Package of the Social Sciences (SPSS v.27.0), using descriptive statistics, reliability tests and normality tests. The Shapiro-Wilk test was used to test for normality of continuous variables, and since all p-values were less than 0.05, the data were not normally distributed, and nonparametric tests were used (Field 2018).

The nonparametric Mann-Whitney and the Wilcoxon-signed rank tested for differences. Scales were created for the following continuous variables as the Cronbach alpha values were above 0.6 (Daud et al. 2018, Zhan et al. 2021): "*Technical Quality*" (4 items), "*Accessibility and Convenience*" (4 items), "*Interpersonal Manner*" (2 items) and "*Time Spent with Audiologist*" (2 items). Although Cronbach's alpha values were below 0.6 for "*Communication*" (2 items) and "*General Satisfaction*" (2 items), scales were created for the following reason. Cronbach alpha values are sensitive to the number of items on a scale. With scales containing few items, it is common to find low values for Cronbach's alpha. In this case, it is more appropriate to check the inter-item correlations for the items. Briggs and Cheek (1986) recommend that the correlations not be below 0.1 (as it is unlikely that a single total score could adequately represent the complexity of the items) or above 0.5 (as the items on a scale tend to be overly redundant) which is the case for the scales "*Communication*" and "*General Satisfaction"*.

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Both participants' groups, semi-structured interview transcripts were anonymised. Data from questionnaires and focus groups were triangulated by clients and audiologists. The authors verified the results, interpreted, discussed the dataset, and generated new codes until data saturation and inconsistencies were resolved. Data were grouped for thematic analysis from the open-ended questions and the focus group for the audiogram and *IMHET*.

3.4. RESULTS

Satisfaction was not significantly different ($p > 0.05$) for both clients and audiologists when using the audiogram or the *IMHET* within each subsection and the overall score of the PSQ (Table 4). Forty-one per cent of respondents (11/27) who received feedback with the audiogram completed the optional, open-ended question of the PSQ. Forty two per cent of the participants (10/24) who received feedback with the *IMHET* completed the open-ended question, and four clients participated in the focus groups. Seven audiologists completed the open-ended question for the audiogram, while only six completed the open-ended question for the *IMHET*. Four audiologists (4/7) participated in the focus group to obtain their perceptions of the *IMHET* compared to the audiogram. When applying thematic analysis, the audiogram and the *IMHET* (Figure 1) identified two domains with three main themes and thirteen sub-themes from the data mentioned above (Tables 4 and 5).

Before the IDA institute updated the tool, the first client who participated in the study used the *IMHET* version with coloured emoticons for the "*Loudness and Clarity*" rating scales. This client specifically noted that the coloured emoticons aided in associating the rating (low, medium, or high) and made it understandable even to children. On the other hand, an audiologist perceived the figure's expression in the first half of the tool

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to be "*unprofessional*". All audiologist participants agreed on the supplemental use of the audiogram with the *IMHET*.

Table 4: PSQ (mean and standard deviation) satisfaction scores for hearing assessment feedback using the audiogram or *IMHET* reported by clients and audiologists

PSQ sub-Section	Clients		Audiologists	
	Audiogram *(n=27)*	*IMHET* *(n=24)*	Audiogram *(n=7)*	*IMHET* *(n=7)*
Technical Quality	4.9 (0.3)	4.8 (0.2)	4.8 (0.5)	4.7 (0.2)
Accessibility and Convenience	4.6 (0.4)	4.8 (0.3)	4.5 (0.4)	4.8 (0.4)
Interpersonal Manner	4.9 (0.2)	4.9 (0.2)	4.7 (0.4)	4.9 (0.2)
Time Spent with the Audiologist	4.8 (0.3)	4.8 (0.3)	4.7 (0.4)	4.6 (0.5)
Communication	4.8 (0.4)	4.9 (0.6)	4.7 (0.5)	4.7 (0.4)
General Satisfaction	4.8 (0.3)	4.9 (0.3)	4.6 (0.5)	4.3 (0.8)
Total PSQ Score	76.8 (3.8)	77.0 (2.5)	74.4 (5.6)	74.9 (2.8)

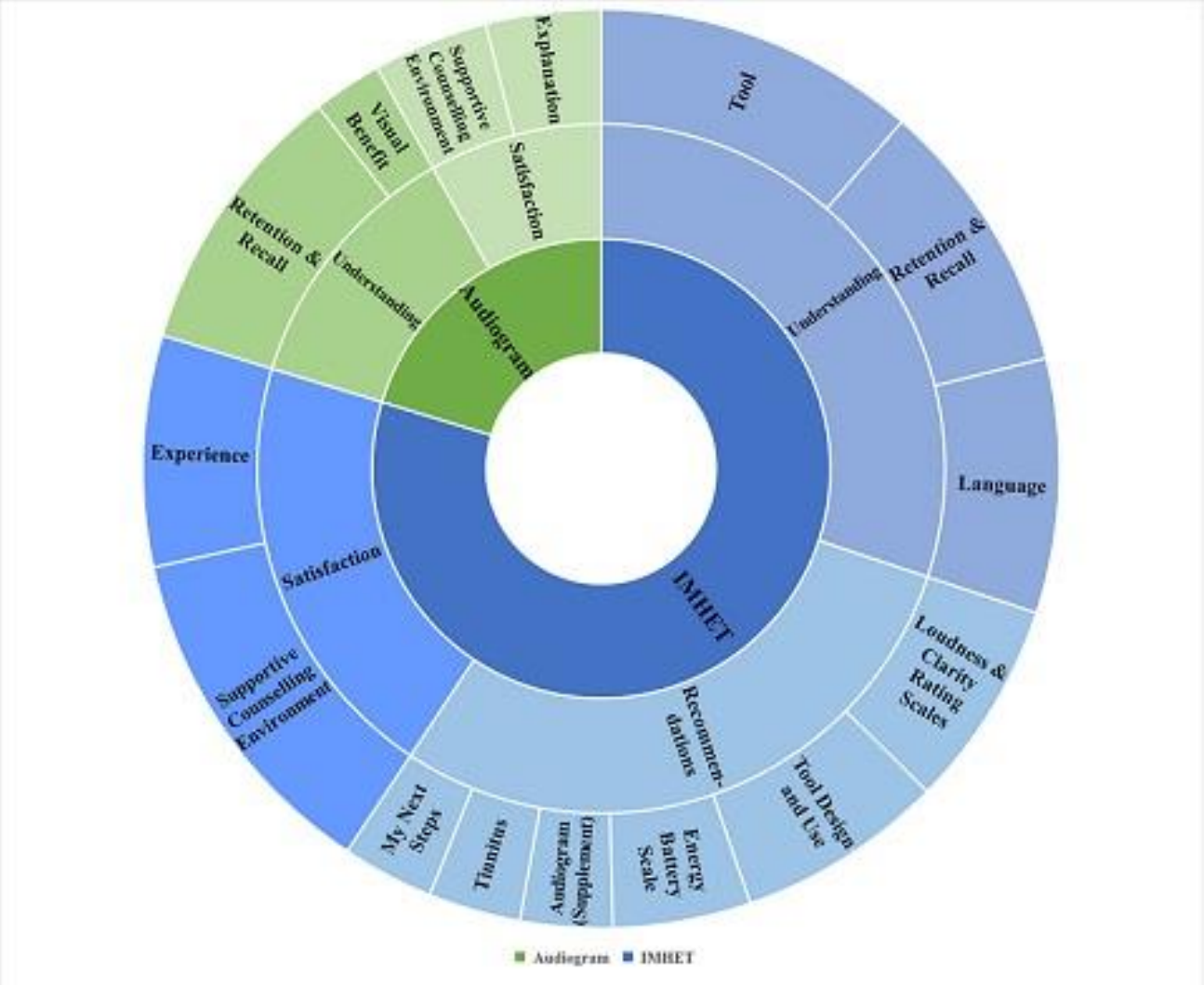

Figure 2. Sundial displaying domains (inner ring), themes (middle ring) and sub-themes (outer ring) identified for the audiogram and *IMHET*

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Table 5: Thematic analysis of perceptions regarding the audiogram from clients (n=11) and audiologists (n=7)

Theme	Sub-Theme	Clients Perception	#	Audiologists Perception	#
Understanding	**Retention and Recall**	*"I have a better understanding of my hearing ability and what I struggle with."* *"I am not sure that I will remember 100% that [is] on the graph."*	6	*"Other than pure tones", [clients] struggle to understand the rest of the test battery."* "*It can be compared between different audiologists at different times as all audiologists use the audiogram."*	5
	Visual Benefit	*"Seeing the visible results on a graph aided in my understanding."* *"Clearly explained with diagrams of hearing tests."*	*2*	*"As an audiologist, I use the audiogram…to show…where on the frequency spectrum certain sounds are and to explain what all the sounds are what they have just heard."*	1
Satisfaction	**Explanation**	*"Excellent attention, explanations and discussion of tests and results. Completely satisfied with everything."* "*Precise and to the point."*	**3**	*"I never struggled with my patients struggling to understand my explanation of the audiogram… they want to know all the detail."* *"The audiogram is a powerful, detailed tool full of useful information when explained in an appropriate way that is patient-centred."*	2
	Supportive Counselling Environment	*"It made me feel that it had been worthwhile to have a hearing test."* *"The audiologist confirmed my suspicions that I have a minor HL."*	**3**	"*I use the audiogram…to show them the…low and high frequencies and how it translates to their difficulties."*	1

#: Frequency

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Table 6: Perceptions of the My Hearing Explained Tool from Clients (n=10) and Audiologists (n=6) with example quotes

Theme	Sub-Theme	Client Perception	#	Audiologist Perception	#
Understanding	**Tool**	*"user-friendly, simple and self-explanatory."* *"Looking at the tool a few weeks later, I still understand it completely."* *"Very simple and easy to understand. It is quick and easy."*	*8*	*"The IDA tool is easier to understand than the audiogram."* *"I will not be able to explain an HL with just only the tool…the tool did not help…me explain it better than ordinarily…too simplistic… it was difficult to explain the high and low-frequency results with just the tool."*	6
	Language	*"My hearing was at capacity."* *"The language is also easy to understand."*	*6*	*"The tool helped me realise…it is good to always rephrase and use it in easier terms…this is just a good reminder… to relay the information in an easier way."* *"Often, we… lapse into a script, and this… breaks [the] routine of following the explanation of the audiogram."*	5
	Retention and Recall	*"It makes sense that I need a hearing aid."* *"I have been able to explain the story behind my ears for the last two months."* *"Wonderful handout to work through afterwards and also to explain to others."*	*6*	*"This makes it easier for [clients] to explain [their hearing ability] to the family members at home."* *"The tool helps to relate it into layman's terms, especially when they take it home when their spouses did not come to the appointment."*	6
Satisfaction	**Experience**	*"The experience is the best you can get."* *"I am very satisfied … I cannot complain."*	*5*	*"Definitely continue to use the tool going forward" (n=3)* *"Because I have had my traditional way of giving feedback for several years, it felt like more is needed but not with all patients."*	5
	Supportive Counselling Environment	*" It was not overwhelming."* *"The tool was not intimidating at all…You do not have to be afraid of the person using big words. "* *"She… listened to me."*	*9*	*"It created a comfortable and calm environment… as you work through it together and discuss it. It reduces pressure on clients."* *"The tool to make it easier for them with their complaints or what they are struggling with. "*	6

#: Frequency

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Table 7: Clients (n=10) and audiologists (n=6) overall perceptions of the *IMHET* sub-themes and specific recommendations with example quotes

***IMHET* Sub-Themes**	***Overall Perceptions***	**#**	***Specific Recommendation***	**#**
Tool Design and Use	*"[for] gradual hearing losses to use it… over time. The tool would be great for students to gain confidence when learning how to give feedback. It will work with all socio-economic groups."* *"Still not too shallow and immature" … "It is a take-home tool for patients ... It is something to do with the patient and for them to take home."*	6	*"The [figure] at the top takes a lot of space. I would like to write in that space. Almost if you took the scales and translated them with the figure, each ear would have its scales by the ear (loudness, clarity, word recognition at each ear) and then cognition at the top…This picture and these scales could easily be integrated a bit better."*	3
Loudness & Clarity Rating Scale	*"Gave me a little bit more interaction when we did the feedback. It was not just me saying the results, but I also asked them I rate it low. Do you agree with this, and that made it a little bit more interactive"?*	2	*"I would prefer it to be broken up in … low frequency and high frequency…You can have a poor high-frequency threshold and yet good word recognition scores. I would prefer it to be my ability to hear high, low pitch sounds and speech to be broken down more."* *"It would be nice for there to be a section for the client to rate their ability for speech in noise and speech in quiet."*	5
My Next Steps	*"Communication strategies is irrelevant for a first consultation"* *"She was clear and wrote down the next steps is going to the ENT"* *"I like my next steps and communication strategies as it started open-ended other conversations beyond hearing aids."*	3	*"Perhaps if there was an additional space…where you can put down more specific comments where there is currently only the section for other. So, you can say return in two weeks for hearing aid discussion or send quotation before next appointment."* *"I would remove the communication strategies section as it was irrelevant at the first hearing consultation and more for situations like hearing aid fittings."*	1
Energy Battery Rating Scale	*"Most of [the clients] struggled with [this section]"* *"Not misleading but ambiguous as it can be interpreted in one of two ways… I was never too sure if you require a lot of energy or if your energy is low after listening"* *"Actually, opened up the discussion to think about the effect of the HL…I actually enjoyed the energy for listening bar more."*	4	*"I would rather have the term effort or listening effort there than the battery because that would help explain it there for them [clients]"*	2

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IMHET Sub-Themes	*Overall Perceptions*	#	*Specific Recommendation*	#
Tinnitus	*"I wanted to understand why this is happening to me… my hearing is almost fine it is just that I cannot distinguish all sounds properly… sometimes, there is damage somewhere."*	1	*"I would add a tinnitus bar as 80% of the clients also had tinnitus which was their biggest concern…and a bar of how it affects them would also be good."*	3
Audiogram (Supplement)	*"With the audiogram, [the client] have a deeper understanding of the anatomy of hearing, whereas, with the tool, it lacks depth. But some people need more information where others would be satisfied with what is on the tool alone."*	1	*"I don't think I can compare the two [IMHET and audiogram]. They are not mutually exclusive... It won't be enough to only use the tool I will need my audiogram to explain the tool."* *"I [would use the IMHET] in combination with the audiogram side-by-side, then I [would] translate it to the IMHET."*	5

#: Frequency

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3.5. DISCUSSION

Clients' and audiologists' satisfaction ratings were not significantly different for hearing assessment feedback between the *IMHET* or audiogram. Although not significant, the overall satisfaction rating was higher with the *IMHET* than the audiogram for both clients and audiologists. Audiologists generally were comfortable using the *IMHET* tool for feedback, but they perceive the audiogram as essential alongside the *IMHET*.

The results suggest that clients recall broader intervention plans with the *IMHET* and audiologists noted increased awareness to simplify feedback. Audiologists described the functional impact of clients' hearing ability with the *IMHET* using "*simple and understandable terms*". Unless meticulously explained, the audiogram remains a multifaceted graph upon face value and clients often struggle with content beyond pure tones (Klyn et al. 2021; Watermeyer et al. 2012). In this and other studies, audiologists describe the shift from "*detailed*" information counselling with the audiogram (Klyn et al. 2021; Watermeyer et al. 2015) to simplified and individualised feedback with the *IMHET*. The shift reflects in clients' recall and diction choice. With the *IMHET* clients described their hearing ability using terms like "*capacity*" instead of technical terms akin to "*minor hearing loss*" with the audiogram. Clients recalled their diagnosis and intervention options with the audiogram (Watermeyer et al. 2012). However, the diagnosis and broader intervention plans were recalled with the *IMHET*, ranging from the client's quality of life to communication strategies. One audiologist stated: "I *like my next steps and communication strategies as it started open-ended conversations beyond hearing aids*." With the audiogram, clients also expressed their concern that they will *"not remember 100%"* of the feedback. However, one client interestingly reported that they *"understood…at a medical level as well*".

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One of the sub-themes that emerged from the analysis was a supportive counselling environment for the audiogram and *IMHET*. A common phenomenon that clients experience in the health care sector is the uncertainty and stress of the unfamiliar consultation room and assessment procedure (Klein et al. 2011). Klein and colleagues (2011) found that these variables were barriers to requesting further information. When using the *IMHET*, the environment was described as "*not overwhelming [or] intimidating*" and the audiologist actively listened ("*she…listened to me*"). Whereas one audiologist who used the audiogram reported that some clients "*just go yes, yes, yes"*, which may indicate a sense of being overwhelmed. These findings emphasise the need for a supportive counselling environment during hearing assessment feedback and the *IMHET* may facilitate this easier (Blom et al. 2019). When addressing clients' emotional states with the *IMHET*, cognitive processing may increase, resulting in the improved recall of feedback information (Luterman 2021).

The need to address clients' emotional states was seen in conjunction with clients explaining their hearing ability to communication partners (Blom et al. 2019). The audiologists unanimously agreed that the *IMHET* was most valuable as an educational information sheet during the focus groups. The *IMHET* being "*user-friendly*" and "*self-explanatory*", assisted clients to recall their hearing ability and then referred to the *IMHET* tool in the discussion. Previous studies have also acknowledged the need for written information as clients often feel overwhelmed or misunderstand information during hearing assessment feedback (Chia & Ekladious 2020; Klein et al. 2011). The *IMHET* allows clients "*to relate to the results*" and "*explain*" it in "*layman's terms "to "family members at home".* Consequently, the *IMHET*'s objective to assist clients in relaying their hearing ability to communication partners (Blom et al. 2019) was most successful, as the *IMHET* acts as a guide during this conversation for clients.

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One audiologist reported in the focus groups that she will not be implementing the tool as a standard practice but on an "*as-needed basis*" with the audiogram, due to the limited consultation time. When applying PCC tools, a common perception is that it is time-consuming, and that time is the most significant barrier when addressing a client's socio-emotional needs within the allocated consultation time (Johnsen et al. 2021; Ekberg et al. 2020). However, Luterman (2021) suggests that clients can only progress effectively through hearing rehabilitation as they are emotionally prepared. Consequently, taking the time as an audiologist to discuss and interact beyond the results will be beneficial in the long term and align with PCC principles (Johnsen et al. 2021). The *IMHET* achieved "*more… interaction, especially with the energy for listening scale*". When rating this scale, audiologists prompted clients to discuss and rate their listening effort and quality of life within their social environment. Prioritising time for such discussions and advocating for PCC tools can be beneficial (Johnsen et al. 2021) as clients seek information and support (Ekberg et al. 2020) beyond the audiogram's results. However, refinement and advocating for PCC are required to ensure clinical development and improved client outcomes for PCC applications (Johnsen et al. 2021; Luterman2021).

Valuable recommendations were identified in the *IMHET* focus groups to improve the tool. Recommendations were specific to design and use, "*Loudness and Clarity*" rating scale, *"Energy Battery*" rating scale, "*My Next Steps"* section, tinnitus and most predominantly using the audiogram with the *IMHET*. All audiologists noted the complimentary use of the audiogram with the *IMHET* (and vice versa). They reported that the audiogram is a "*detailed tool full of useful information* ", with one indicating that it must be explained, "*in an appropriate way that is patient-centred*". Audiologists also noted the perceived shortfalls of the *IMHET* in explaining high and low-frequency

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results and describing the degree and configuration of the hearing loss. Audiologists made recommendations to expand the *IMHET* scales and use more familiar imagery (emoticons) to address some of the concerns of the "*Loudness and Clarity*" rating scales. Two audiologists also indicated that it would be beneficial to include tinnitus in the *IMHET*. However, this is a common shortfall for both the audiogram and *IMHET* in not explicitly facilitating tinnitus discussions during feedback.

The main limitation of this study was the limited sample size of audiologists for phase one. Furthermore, most client participants who resided in urban areas were English or Afrikaans and had a minimum of secondary education. Future studies require a larger sample size to determine significant differences and generalisability (age, cultural and linguistic origin, education level, public vs private setting) when determining the satisfaction ratings of the applied recommendations. The study's results concur that both tools enable informational counselling, but what makes the *IMHET* unique to the audiogram is that it facilitates more engagement and acts as an educational information sheet for clients. Consistently implementing PCC strategies and tools without disrupting a coherent workflow have favourable client satisfaction outcomes and improves client understanding (Chia & Ekladious 2020; Watermeyer et al. 2020). PCC tools can support the engagement of audiologists to make hearing consultations more person-centred.

3.6. CONCLUSION

The *IMHET* is a valuable educational information sheet for clients after receiving a hearing assessment. Clients reported the *IMHET* to be user-friendly, self-explanatory, and conducive to a supportive counselling environment. Audiologists recommend that the audiogram be used as a supplement when using the *IMHET* to provide feedback.

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The *IMHET* is an alternative or additional feedback tool that incorporates simplified language, enables individualised feedback, and can foster client interactions. Recommendations to improve the *IMHET* could further enhance its usefulness for audiologists and clients.

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CHAPTER 4: DISCUSSION, CLINICAL IMPLICATIONS AND CONCLUSION

4.1. OVERVIEW OF RESEARCH FINDINGS

This study investigated audiologists' and clients perceived satisfaction and understanding of hearing assessment feedback when using either the standard audiogram or *IMHET*. As both clients and audiologists rated, the quantitative measure (PSQ) showed no significant difference between the tools, with the overall satisfaction rating being higher for *IMHET* over the audiogram. The qualitative component (focus groups and open-ended questions) provided insight into participants' perceptions. Audiologists were generally comfortable using the *IMHET* tool for feedback but indicated that the audiogram is essential, whereas the *IMHET* can be used alongside it during feedback.

4.1.1. Audiogram Findings

During the focus group discussions, audiologists emphasised the diagnostic value of the standard audiogram. One audiologist stated that the audiogram was a "*benchmark*" used to describe the clients' hearing ability "*across the frequency spectrum*" relating to speech sounds. Unless meticulously explained, the audiogram remains a multifaceted graph to non-professionals upon face value (Klyn et al., 2021; Watermeyer et al., 2012). One audiologist in the focus groups noted that clients also struggle with "*content beyond pure tones*", contributing to the complexity of the audiogram.

In the client's open-ended question, the main comments focused on the audiologist's attention to detail in explaining the test battery when using the audiogram. Watermeyer et al. (2012) found similar findings where the complexity of the audiogram became the

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centre point of the feedback instead of the overall diagnosis. Audiologists also reported that the audiogram was a "*detailed tool full of useful information ",* with one indicating that it must be explained "*in an appropriate way that is patient-centred".* One barrier to applying PCC principles whilst giving feedback with the audiogram is technical jargon for objective tests (Moore et al., 2017). According to Watermeyer et al. (2020), when the focus during feedback is the test battery, an outcome may be inattention to clients' emotional states or opportunities for counselling. One audiologist, who used the audiogram, noted that some clients *"just go yes, yes, yes*", which may indicate a sense of being overwhelmed and passive interaction.

Despite Watermeyer et al.'s (2012) findings that clients who lack recall of the audiological test battery have reduced comprehension of their hearing ability, clients in this study could competently recall their hearing ability status and intervention plans. Clients expressed their concern that they will "*not remember 100%"* of the feedback with the audiogram. However, one client interestingly reported that they *"understood…at a medical level as well*".

4.1.2. IMHET Findings

After hearing assessment feedback, clients' most recalled information is the diagnosis and intervention options. With the *IMHET*, writing down the intervention plan increased recall for clients. One client stated in the open-ended question, "*I better understand my hearing ability, what I struggle with, and what we will do."* Another client stated, "*Giving the steps from here onwards you will go to the ENT made it simple."* Audiologists described the functional impact of clients' hearing ability with the *IMHET* using "*simple and understandable terms*" during the hearing assessment feedback. The *IMHET* being "*user-friendly*" and "*self-explanatory*", assisted clients to recall their hearing ability and then referred to the *IMHET* in the discussion.

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The *IMHET* facilitated discussions and recollections about the following topics during the open-ended questions and focus groups: (i) quality of life with their communication partners, (ii) communication contexts and (iii) recalled communication strategies to assist them. One audiologist stated: "*I like my next steps and communication strategies as it started open-ended conversations beyond hearing aids."*

Contrary to the researchers' expectations, audiologists reported that the *IMHET* was not a feedback or counselling tool, and the sole use of the tool would be limited to specific populations that do not require detailed feedback. One audiologist noted that the *IMHET* alone would not be ideally applied when consulting younger adults. The audiologist suggested that "*young*" clients "*prefer in-depth explanations of results*" and tests procedures which the audiogram facilitates.

The *IMHET* facilitated a supportive counselling environment (Blom et al., 2019) as clients described the tool as "*not overwhelming [or] intimidating*", and their experience with the audiologist that she actively listened *("she…listened to me*"). Notably, despite client satisfaction being higher when shared decision making occurs (Stacey et al., 2014), it remains a challenge for audiologists as they struggle to include clients during information sharing (Gravel et al., 2006; Johnsen et al., 2021). With the *IMHET*, audiologists reported the discussion of each sub-scale, fostering interaction and validation as a client stated that the feedback *"[confirmed] suspicions that [they] have an HL*". Therefore, prioritising time for such discussions and advocating for PCC tools can be beneficial (Johnsen et al., 2021) as clients seek information and support (Ekberg et al., 2020).

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4.2. CLINICAL IMPLICATIONS

Five clinical implications (Figure 3) arose from this study. The first was that the audiologists unanimously agreed that the *IMHET* was an educational information sheet. This statement corresponds to the need for a one-page, simplified resource to take home and refer to after hearing consultations (Blom et al., 2019). For both audiologists and clients in the PSQ, the "*Accessibility and Convenience*" of the *IMHET* showed the most reported satisfaction, despite not being quantitatively significant. Evidentially, three out of four clients in the focus groups retained the *IMHET* handout as a record.

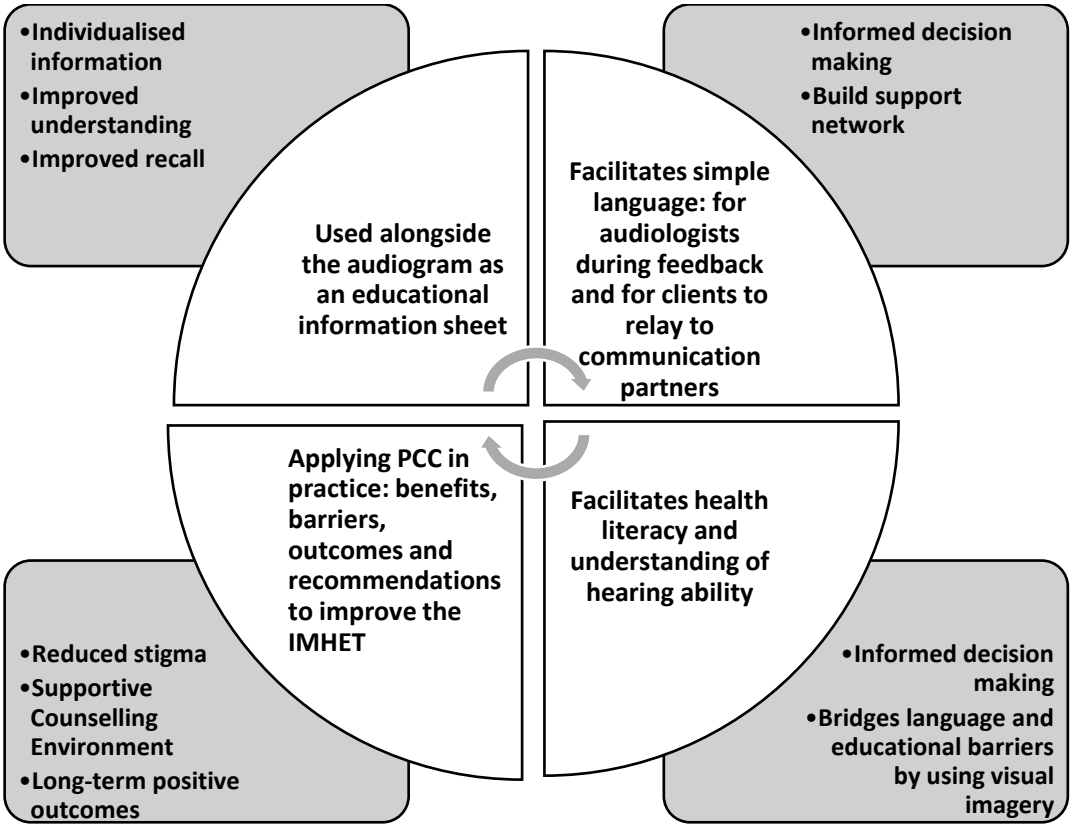

Figure 3: *IMHET* value for clients and audiologists relating to the purpose of the tool and outcomes

Previous studies have acknowledged the need for written information as clients often feel overwhelmed or misunderstand information during hearing assessment feedback

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(Chia and Ekladious, 2020; Klein et al., 2011). The study's results substantiate the client's need to access individualised information beyond the understandable and "*script-like"* feedback when using the audiogram.

Secondly, the *IMHET* can be used by clients after feedback "*to relate to the results*" and "*explain*" it in "*layman's terms*" to "*family members at home*". Audiologists removing jargon from explanations and simplifying feedback echoes clients' recall and diction choice when they relay the feedback to others. One client's husband agreed that the tool assisted in understanding his wife's hearing ability as she competently described her hearing ability using "*simple terms*".

Cumulatively, using basic language, written feedback, and visual references (like the audiogram's diagram or *IMHET*'s figure) leads to the third clinical implication of improved health literacy and informed decision making when using feedback tools. This study also adds to the plethora of evidence-based and best practice principles when making medical information sheets and advocating for health literacy (Madkouri et al., 2016; Oliffe et al., 2019; WHO, 2022). Caposecco et al.'s (2016) findings align with this study's recommendations to use primary language, adapt the layout of content, apply user-friendly graphics, and increase the font size when designing medical information sheets. Other aspects of best practice for health literacy are allowing more detail when clients self-report their hearing ability or using space more efficiently to enable additional writing space (Caposecco et al., 2016).

The fourth clinical implication recognised by audiologists was that PCC principles and tools could be applied within standard protocols, resulting in positive outcomes. Clients who received feedback with the *IMHET* described their hearing ability using terms like "*capacity*", which omits the negative word associations (self-stigmatisation and public

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stigmatisation) of HL. The perceived stigma of HL can influence clients' acceptance and the decision-making process for clients to act on their hearing ability (Schönborn et al., 2020; Wallhagen, 2010). The prolifically used term "*HL*" with the audiogram may have negative associations due to reduced hearing ability (Wallhagen, 2010). In contrast, with the *IMHET*, the focus shifted to what hearing ability remains (i.e., "*capacity")*, consequently increasing understanding and recall for future intervention options.

The study has also increased audiologists' awareness of PCC and promoted the application of PCC tools within standard protocols. The above-mentioned findings explain why all audiologists unanimously agreed that the *IMHET* must be used with the standard audiogram, as the *IMHET* will assist with content "*beyond pure tones"* (Figure 4). The standard audiogram remains a complex diagnostic tool that quantifies HL's type, degree, frequency, and loudness (i.e., pure tone average). The *IMHET* allows the audiologist and client to describe the audiogram records in a simplified language using terms like "*Loudness of Sound, Clarity of Speech* and *Brain Energy".* Consequently, using both feedback tools together can be conjectured to higher satisfaction and understanding of hearing assessment feedback as the visual imagery compliments the individualised text, and the simplified language eases comprehension (Figure 4).

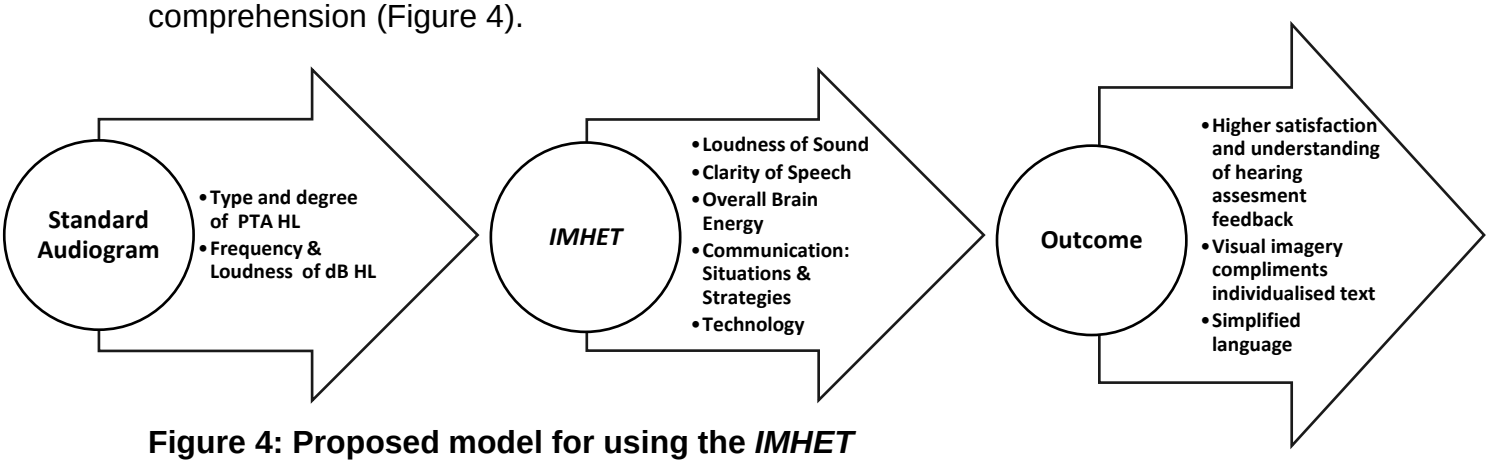

Figure 4: Proposed model for using the *IMHET*

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Audiologists specifically noted the *IMHET's* limited value due to the time constraint. One audiologist stated that she would only use *IMHET* on an "*as-needed basis*" with the audiogram. When applying PCC tools, time is a significant barrier when addressing a client's socio-emotional needs within the allocated consultation time (Ekberg et al., 2020; Johnsen et al., 2021). Luterman (2021) suggests that clients can only progress effectively through hearing rehabilitation as they are emotionally prepared. Literature reports that audiologists were neither sensitive to clients' socio-emotional needs (Watermeyer et al., 2015) nor accurately and effectively addressing clients' emotional states (Bennett et al., 2020).

Consequently, taking the time as an audiologist to discuss and interact beyond the results will be beneficial in the long term and align with PCC principles (Johnsen et al., 2021). Still, refinement and advocating for PCC are required to ensure clinician development and improved client outcomes for PCC applications (Johnsen et al., 2021; Luterman, 2021). The recommendations made about the *IMHET* are a prime example of the refinement process of PCC.

The fifth outcome was when audiologists made valuable recommendations to improve the understanding and satisfaction of the *IMHET* in the focus groups. The difficulties that audiologists experienced with the *IMHETs* were explaining audiometric results from the low to high frequencies, including describing the degree and configuration of the HL. Expanding the "*Loudness and Clarity*" rating scales or improving the *IMHET's* user ability when applying familiar imagery (emoticons) was recommended as a client stated that any age would understand the message. A derivative of the *IMHET*, used at the beginning of the study, indicated that clients found value in using colours to rate their hearing ability.

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Consequently, incorporating colourful visual imagery associated with the degree of HL could aid clients in understanding their hearing ability. Two audiologists indicated that discussing tinnitus during hearing assessment feedback can be valuable when applied to the client. The audiogram and *IMHET* can be used in conjunction with the "*Tinnitus Thermometer*" and "*Tinnitus Communication Guide"* of the Ida Institute (2022) to address this consideration.

Cognition or the "*Energy Battery"* rating scale can also be termed "*Listening Effort"* to avoid ambiguity. As one audiologist stated that "*Most of [the clients] struggled with [this section]"* because even she, as the audiologist ", *I was never too sure if you require a lot of energy [when listening] or if your energy is low after listening".* Lastly, the "My Next Steps" section can provide more space "*where you can put down more specific comments where there is currently only the section for others. So, you can say return in two weeks for hearing aid discussion or send quotation before next appointment."* A proposed *IMHET* based on the recommendations is in Appendix J.

4.3. CRITICAL EVALUATION: STRENGTHS AND LIMITATIONS OF THE CURRENT STUDY

4.3.1. Strengths of the current study

- The study followed a mixed-method design, allowing for quantitative and qualitative information to be collected.
    - The mixed-method design was beneficial in contextualising clients' experiences within a meaningful clinical setting.
    - Measuring client outcomes using a mixed-method design ensured scientific rigour (Regnault et al., 2018) as the study's aim was considered from different perspectives and within different contexts (triangulation).

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  - Complementary and significant factors were found when combining the opinions of the qualitative data with the standardised and validated PSQ data.
  - The quantitative information showed no significant difference between the tools. Whereas the qualitative information derived from the focus groups reported in-depth information, supportive information about the feedback tools.

- Data saturation through rigorous cross-checking of thematic analysis and confirming conclusions ensures interpretive consistency and credibility of the meta-inferences made of the triangulated data (Korstjens & Moser, 2018).
  - Broader meta-inferences regarding understanding or recall of hearing assessment feedback required rigorous reviews than straightforward statements concerning a supportive counselling environment.
  - Corrigan & Onwuegbuzie (2020) state that representative meta-inferences of the sample ensure generalisability within the mixed-method design. For example, without consideration of the different feedback tools, clients' high satisfaction PSQ scores will correspond to the open-ended question or focus groups that they had high satisfaction and understanding through statements (*"Completely satisfied with everything")*.
- What differentiates this study from others is that it is one of the first that also proposes practical recommendations for improving the *IMHET* as the audiologist focus group specifically gave insight and valuable recommendations.

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- The study also used an RCT which ensured a comparative study between the control (Audiogram) and intervention (*IMHET*) feedback methods.
    - Clients' demographics were not generalisable despite randomisation.
    - However, the control and intervention groups were similar, allowing the comparison between trial arms.
- The minimum sample size calculated using prio-power analysis projection was 18. This study included 27 clients who received feedback with the audiogram and 24 with the *IMHET*, thus exceeding the minimum sample size required.

4.3.2. Limitations of the current study

The main limitation of this study was the limited sample size of audiologists for phase one leading to reduced generalisability and deductions drawn from the PSQ. Secondly, most client participants (see table two for client demographics) resided in urban areas, were English speakers and had a minimum of secondary education. One audiologist stated, "*the clientele [she] see[s] [were] first language English educated people with good graphical literacy… [She] never struggled with … clients struggling to understand … feedback with the audiogram."* This quote illustrates the importance to include client participants from various languages for future studies and whether they were first or second language users.

4.4. RECOMMENDATIONS FOR FUTURE RESEARCH

The following recommendations were based on the critical evaluations of the research project:

- Future studies require a larger sample size (cultural, linguistic, various educational levels, public vs private settings) to determine significant differences and generalisability when determining the satisfaction ratings of the applied recommendations.

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- The *IMHET* derivative for children should also be defined and compared to the standard audiogram when providing hearing assessment feedback to caregivers.
- Within a longitudinal study, the effect of PCC using tools like the *IMHET* can explore ultimate client outcomes. Consideration factors may be compliance with recommendations, hearing aid usage and satisfaction, and quality of life.
- Future studies can further investigate the long-term consequences of PCC tools and principles. What is currently known is that PCC communication links to reduced expenses and longer consultation times (Epstein, 2005).
- Future RCTs can explore the long-term outcomes (time, financial implications, compliance to recommendations) when audiologists spend time addressing clients' socio-emotional needs despite the time barrier (Johnsen et al., 2021; Ekberg et al., 2020). Epstein et al. (2005) has touched on this by finding that shorter consultation times are reported long-term, but the future RCT can specifically relate to the *IMHET* and confirm or deny the findings.

4.5. CONCLUSION

The *IMHET* is a valuable educational information sheet for clients after hearing assessment feedback. When using either the *IMHET* or the audiogram as feedback tools, clients were satisfied and understood their hearing ability. Clients reported the *IMHET* to be user-friendly, self-explanatory, and conducive to a supportive counselling environment. However, audiologists recommend supplementing the audiogram with the *IMHET* to provide detailed diagnostic feedback. Recommendations to refine the *IMHET* could further enhance its usefulness for audiologists and clients.

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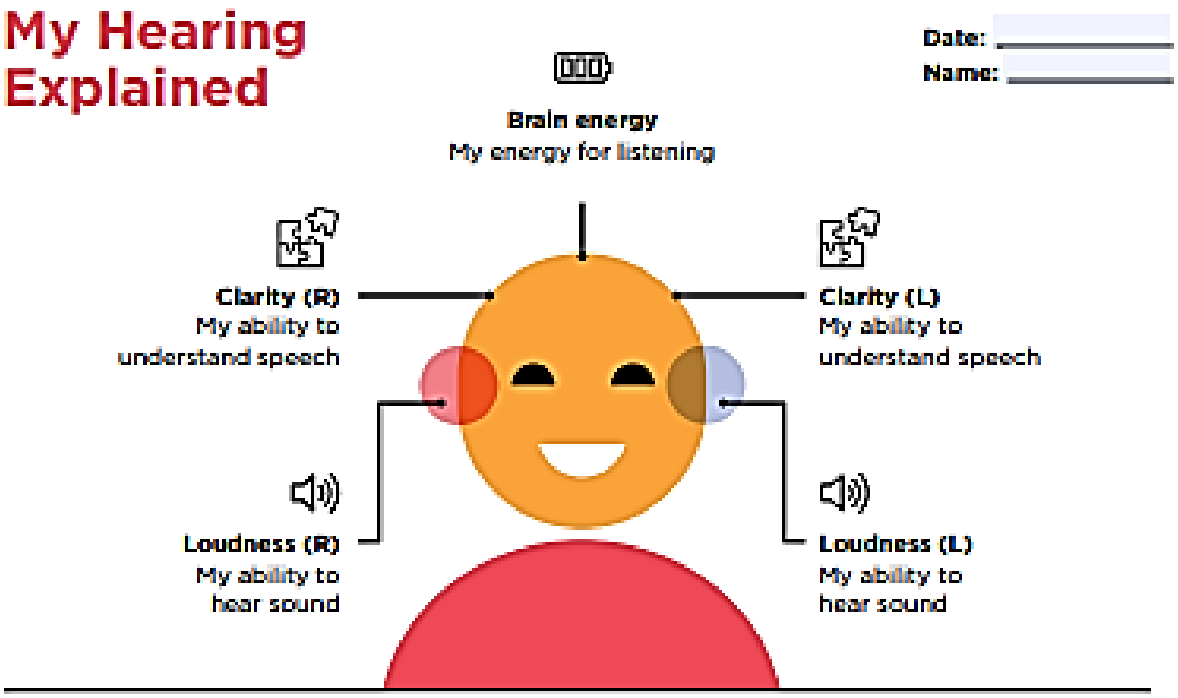
CHAPTER 6: APPENDICES:

Appendix A: Ida Institute's Original My Hearing Explained Tool (*IMHET*)



My ability to hear sound is:

(R) Low Medium High

(L) Low Medium High

My ability to understand speech is:

(R) Low Medium High

(L) Low Medium High

My energy for listening is:

Low Medium High

My everyday life

What I struggle with:

What I can hear:

My most important communication situations:

1.
2.
3.

My next steps

Technology to help me:

My communication strategies:

1.
2.
3.

Other:

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Appendix B: Ethical Clearance Letter

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100
Since 1919

29 January 2021

Dear Ms LA Nell

Project Title:	Patients and audiologists' perceived understanding and satisfaction of the Ida Institute's, My Hearing Explained Tool compared to the audiogram.
Researcher:	Ms LA Nell
Supervisor(s):	Prof DCDW Swanepoel Mrs KC De Sousa Dr F Mahomed Asmail
Department:	Speech Language Path and Aud
Reference number:	17032416 (HUM011/1220)
Degree:	Masters

I have pleasure in informing you that the above application was **approved** by the Research Ethics Committee on 29 January 2021. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely,

Prof Innocent Pikirayi
Deputy Dean: Postgraduate Studies and Research Ethics
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: PGHumanities@up.ac.za

Research Ethics Committee Members: Prof I Pikirayi (Deputy Dean); Prof KL Harris; Mr A Bosse; Dr A-M de Beer; Dr A dos Santos; Ms KT Govinden; Andrew; Dr P Gukura; Dr E Johnson; Prof D Maree; Mr A Mohamed; Dr I Nooroo; Dr C Ruttenjill; Prof D Reyburn; Prof M Sowc; Prof E Taljard; Prof V Thebe; Ms B Tsebe; Ms D Mokalapa

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Appendix C: Informed consent for Audiologists at Private Practises

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Department of Speech-Language Pathology and Audiology

Dear Participant,

I, Louise Nell, am a student completing my Master's degree in Audiology at the Department of Speech-Language Pathology and Audiology, University of Pretoria. The study aims to establish the understanding and satisfaction of the Ida, *My Hearing Explained* tool, as perceived by patients and audiologists when providing hearing evaluation feedback compared to the audiogram.

This letter provides information to help you decide if you would be willing to participate in this study. Before you agree to participate in this study, you should fully understand.

I ask that you read this document and ask questions, should you have any, before agreeing to participate in the study.

Participants: Audiologists registered with the HPCSA for two years or more working in private practice. These audiologists must exclusively use the audiogram for feedback and have no prior knowledge of the Ida, *My Hearing Explained* tool.

Procedures: I wish to include the organisation, you (the audiologist) and the patients you see at your practice for data collection purposes. If you consent to participate in the study, it will be asked of you to undergo a training session regarding the *My Hearing Explained* tool, which will take 30 minutes at most. The training session will provide guidelines on implementing the *My Hearing Explained* tool and a conversational example.

The patients who have consented to participate in the study will be randomly selected, and a computer-generated database will randomly allocate the intervention. The patients' files and personal details will not be needed, as sole interest is on their perception of the feedback method. You will be expected to provide feedback using the audiogram, as you routinely would, and provide feedback using the Ida, *My Hearing Explained* tool. Afterwards, the patient will be asked to complete a questionnaire to rate their experience when provided feedback. You will be asked to complete a similar questionnaire after providing feedback to all their patients.

A week after your consultation, you will be asked to partake in an online focus group discussion that will be recorded for about one hour. The group will consist of four audiologists' who participated in this study. The researcher will ask three questions, which you can answer as you feel comfortable.

If your patients so choose, they will attend a similar, hour-long focus group discussion where six patients participated in this study. The researcher will ask three questions. Of which they are welcome to answer the questions as they feel comfortable. An online platform will be used to adhere to COVID-19 regulations.

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Your rights as a volunteer

Your participation in this research is entirely voluntary. You have the right to withdraw from the study at any time. Should the patient want to withdraw from the research project, they may do so without any negative consequences. This study will not affect the patients' services at the audiology practice.

Confidentiality

Please note that the data obtained will be used for research purposes only. All personal or sensitive information will be kept confidential. The patients will need to provide informed consent to participate, and only once consent has been provided will they be included in the study. A computer-generated database will allocate the feedback method before consent. No personal identifying or sensitive information will be disclosed if this research project is published.

Risks and Benefits

There are no risks involved during this study, and you will not be negatively influenced in any way. You will benefit from this study by experiencing a different explanation of a patient's hearing ability.

Sharing of results:
Results obtained from this research study will be shared in the form of a scientific article and dissertation, which will be made available to the professionals in Audiology. If you wish to have a copy of your results from these tests, we will make these available to you once the research is complete.

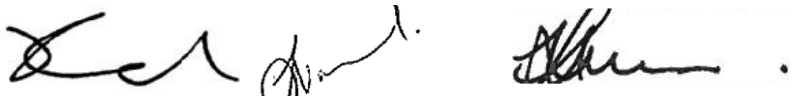
Data storage

On completion of the study, data (recordings, transcripts, and questionnaires) will be stored in both digital and hardcopy at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a minimum of 15 years for research and archiving purposes. Simultaneously the published article will also be stored in an open access data depository.

Should you require any additional information or clarification on the above information, please contact Louise Nell at 084 477 6811.

Kindly complete the informed consent form if you wish to use these services and participate in this research project. Thank you for exhibiting interest in this research project and for your participation and assistance.

Louise Nell
Researcher



Prof DW Swanepoel, Dr F Mahomed-Asmail, Mrs De Sousa
Supervisors

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Participant information number	

Informed consent

I, _____ (name and surname) voluntarily consent to participate in the study titled: **Patients and audiologists' perceived understanding and satisfaction of the Ida Institute's, *My Hearing Explained* Tool compared to the audiogram.** I am aware that I can refuse participation or withdraw the participation in the research at any time. I hereby also give permission that the data be recorded and used for research purposes (for this current study and future studies) and publication in scientific literature.

_____ _____

Participant **Date**

Place Official stamp here

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Appendix D: Informed Consent for Client Participants

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Department of Speech-Language Pathology and Audiology

Dear Participant,

I, Louise Nell, am a student completing my Master's degree in Audiology at the Department of Speech-Language Pathology and Audiology, University of Pretoria. The study aims to establish the understanding and satisfaction of the Ida, *My Hearing Explained* tool, as perceived by patients and audiologists when providing hearing evaluation feedback compared to the audiogram.

Before you agree to participate in this study, you should fully understand it. I ask that you read this document and ask questions, should you have any, before agreeing to participate in the study.

Participants: Male or female adults visiting an audiologist for their initial hearing evaluation from 18 years and older. Participants may have no history of consulting with an Ear-Nose-and-Throat (ENT) specialist or have received other audiologic or speech-language therapy services. Participants will also be included to speak and understand English and respond reliably to unaided pure tone stimuli. If patients choose to participate in a focus group, access to a stable internet connection and a technological device is required.

Procedures: The audiologist will routinely conduct the evaluation, but he/she will provide feedback in one of two ways, either using the audiogram or the *My Hearing Explained* tool. Afterwards, you will be asked to complete a questionnaire to rate your experience when feedback was provided; this will take approximately 10 minutes.

If you were given feedback using the *My Hearing Explained tool* and if you so choose, you can participate in a recorded online focus-group discussion. It will take place a week after your consultation and will take about one hour. The group will consist of six participants who have experienced the tool like you. The researcher will ask three questions, which you can answer as you feel comfortable. An online platform will adhere to COVID-19 regulations, and the session will be recorded for data analysis purposes.

Your rights as a volunteer

Your participation in this research is entirely voluntary. You have the right to withdraw from the study at any time. Participation in this study will not affect the services you receive at the audiology practice.

Confidentiality

Please note that the data obtained will be used for research purposes only. All personal or sensitive information will be kept confidential. Informed consent will be needed for you to participate, and only once you have given your consent will you be included in the study. A

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computer-generated database will allocate the feedback method before consent. No personal identifying or sensitive information will be disclosed if this research project is published.

Risks and Benefits

There are no risks or benefits involved in this study, and you will not be negatively influenced in any way.

Sharing of results

Results obtained from this research study will be shared in the form of a scientific article and dissertation, which will be made available to the professionals in Audiology. If you wish to have a copy of your results from these tests, we will make these available to you once the research is complete.

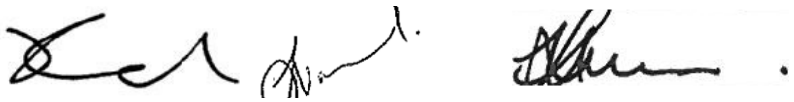
Data storage

On completion of the study, data (recordings, transcripts, and questionnaires) will be stored in both digital and hardcopy at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a minimum of 15 years for research and archiving purposes. Simultaneously the published article will also be stored in an open access data depository.

Should you require any additional information or clarification on the above information, please feel free to contact Louise Nell at 084 477 6811.

Kindly complete the informed consent form if you wish to use these services and participate in this research project. Thank you for exhibiting interest in this research project and your participation and assistance.

Louise Nell
Researcher



Prof DW Swanepoel, Dr F Mahomed-Asmail, Mrs De Sousa
Supervisors

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Participant information number				
Contact Details				
I consent to participate in the focus group	**Yes**		**No**	

Informed consent

I, _____ (name and surname) voluntarily consent to participate in the study titled: **Patients and audiologists' perceived understanding and satisfaction of the Ida Institute's, *My Hearing Explained* Tool compared to the audiogram.** I am aware that I can refuse participation or withdraw the participation in the research at any time. I hereby also give permission that the data be recorded and used for research purposes (for this current study and future studies) and publication in scientific literature.

_____ _____

Participant **Date**

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Appendix E: Adapted Patient Satisfaction Questionnaire – Short Form (PSQ-18) for Client Participants

Adapted from: Marshall & Hays (1994)

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Department of Speech-Language Pathology and Audiology

Participation Information Number	

The following 16 statements are made about the care you received when your hearing ability was explained. Please read each statement carefully, considering what you experienced now when your hearing ability was explained. We are interested in your feelings (whether it is good or bad).

Tick, how strongly do you agree or disagree with each of the following statements?

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. The audiologist was good at explaining my hearing ability as he/she explained it in a simple way that I could understand.					
2. I think the audiologist's office has everything needed to explain my hearing ability.					
3. The explanation I received was sufficient to make an informed decision regarding my hearing ability.					
4. Sometimes the audiologist makes me wonder if what he/she is saying is correct.					
5. The audiologist was very attentive and considerate when explaining everything to me when feedback was given.					
6. Information about my hearing ability is accessible to me.					

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Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
7. The explanation took an appropriate time and was not too long or too short.					
8. The audiologist was too impersonal toward me.					
9. My audiologist treated me in a friendly and courteous manner.					
10. The audiologist that consulted and cared for me was rushed when explaining my hearing ability to me.					
11. The audiologist sometimes did not acknowledge what I told them.					
12. I have some doubts about the audiologist ability to provide me with feedback.					
13. The audiologist spent sufficient time explaining my hearing ability to me.					
14. I find it difficult to remember all the information given to me right away.					
15. I am dissatisfied with the way the audiologist gave me feedback.					
16. I can review the feedback given to me whenever I need to.					

Describe how the feedback method contributed to the understanding of your hearing ability.

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Appendix F: Adapted Patient Satisfaction Questionnaire – Short Form (PSQ-18) for Audiologists

Adapted from: Marshall & Hays (1994)

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Department of Speech-Language Pathology and Audiology

Participation Information Number	

The following 16 statements are made about the care clients received when their hearing ability was explained to them using the feedback tools. Please read each statement carefully, keeping in mind what you experienced when their hearing ability was explained. We are interested in your feelings (whether it is good or bad) about their care.

Tick, how strongly do you agree or disagree with each of the following statements?

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. I explained the client's hearing ability in a simple way that he/she could understand.					
2. I feel I have everything I need in my office to explain clients hearing abilities.					
3. The explanation I gave was sufficient for clients to make an informed decision about their hearing ability.					
4. Sometimes I was uncertain if what I said was correct.					
5. I was very attentive and considerate to the clients when explaining their hearing abilities.					
6. Information about my clients' hearing ability is accessible to them.					
7. The explanation took time and was not too long or too short.					
8. The feedback clients were too impersonal to the clients.					

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Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
9. I treated the clients in a friendly and courteous manner.					
10. I felt rushed when explaining clients hearing ability to them, as the explanation took long.					
11. I sometimes did not acknowledge what clients told me.					
12. I have some doubts about my ability to provide feedback using the *My Hearing Explained tool*.					
13. I spent sufficient time explaining clients hearing abilities to them.					
14. I think clients would find it difficult to remember all the information given to them.					
15. I am dissatisfied with the way I gave feedback when using the tool.					
16. The clients can review the feedback given to them whenever they need to.					

Describe how you would compare the audiogram to Ida's My Hearing Explained tool.

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Appendix G: Focus Group Questions for Clients

Focus Group 1: Client perceptions of the Ida, *My Hearing Explained* tool

Adapted from: Aazh (2016), Ahlâen, Mattsson, & Gunnarsson (2007) and Marshall & Hays (1994)

Welcome, and thank you for taking the time to be here today for the discussion. My name is Louise Nell, and I am a postgraduate student at the University of Pretoria. I will be facilitating today's session. As you know, this study has two phases. Phase one entailed the completion of a questionnaire that you completed. Phase two entails a 30-minute virtual session that we are currently busy with. Please note that the session is being recorded to ensure that no comments are missed and assist during transcription and analysis.

Overview of the topic

Today we will be exploring your perception of the *Ida, My Hearing Explained tool* used to provide feedback after your hearing assessment. We would like to find out about your experience with the tool as a feedback guide on your hearing ability.

Guidelines

I will mention a few guidelines that will facilitate today's discussion.

- The focus group will be around 30 minutes and no longer than 45 minutes.
- I will ask three questions that we will discuss as a group.
- Due to limited time, I apologise if I may interrupt your discussion and move on to the next question to prioritise what is on the agenda.
- Only one person should talk at a time, but everyone will be allowed to voice their opinions.
- Your honest feelings and opinions are what I would like to hear. You should not feel pressured as there are no right or wrong answers. I would just like to know your views even if they may be different from the other participants.
- Despite us all being on a first-name basis. All personal and identifiable data will be removed from the transcript to maintain confidentiality.

We have the following people who have joined us today: …

Now that we all know more about each other. Let us begin with the discussion.

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Opening Question

1. How did you experience receiving feedback with the *My Hearing Explained tool*?

Note: A probe is only necessary if there is a lull in the discussion.
Present the My Hearing Explained tool during this question as a reference.

Free Probes	*Specific Probes*
• What else? • Does anyone have a different thought?	• What was your initial thought of the tool? • What is your opinion of the language and images of the tool?

Approximate Time Allocation: 15 min

2. After receiving feedback, how would you describe your understanding of your hearing ability?

Free Probes	*Specific Probes*
• What else? • Does anyone have a different thought? • Can you elaborate further? • Can anyone think of anything else?	• If anything, audiologists should consider anything else when explaining your hearing ability. What would it be? Tell me how you would describe your hearing ability to a friend or family member? • Can someone give an example of what stood out specifically to you? • What is your overall opinion about the handout?

Approximate Time Allocation: 10 min

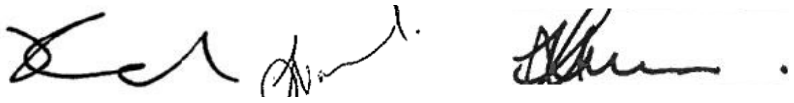
3. Is there anything else you would like to highlight or mention about the *My Hearing Explained tool?*

Free Probes
• What else? • Does anyone have a different thought? • Can you elaborate further? • Can anyone think of anything else?

That concludes our focus group discussion. Thank you so much for sharing your thoughts and opinions with us.

Louise Nell

Researcher



Prof DW Swanepoel, Dr F Mahomed-Asmail, Mrs De Sousa
Supervisors
Adapted from: Aazh (2016) and Marshall & Hays (1994)

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Appendix H: Focus Group Questions for Audiologists

Focus Group 2: Audiologist's perception of the two methods of explaining hearing ability.

Adapted from: Aazh (2016), Ahlâen, Mattsson, & Gunnarsson (2007) and Marshall & Hays (1994)

Welcome to today's discussion and thank you for taking the time to be here today. My name is Louise Nell, and I am a postgraduate student at the University of Pretoria. I will be facilitating today's session. As you know, this study has two phases. Phase one entailed you providing feedback using the Ida*, My Hearing Explained tool* and completing a questionnaire that you kindly completed. Phase two entails the 30-minute virtual session that we are currently busy with. Please note that the session is being recorded to ensure that no comments are missed and assist during transcription and analysis.

Overview of the topic

Today we will be exploring your perception of the *Ida, My Hearing Explained tool* compared to the audiogram when providing feedback. We want to learn about your experience with the tool as a feedback guide of clients hearing ability.

Guidelines

There will be a few guidelines to facilitate this discussion today.

- The focus group should last around 30 minutes and no longer than 45 minutes.
- I will ask three questions that we will discuss as a group.
- Due to limited time, I apologise if I may interrupt your discussion and move on to the next question to prioritise what is on the agenda.
- Only one person should talk at a time, but everyone will be allowed to voice their opinions.
- Your honest feelings and opinions are what I would like to hear. You should not feel pressured as there are no right or wrong answers. I would just like to know your views even if they may be different from the other participants.
- Despite us all being on a first-name basis. All personal and identifiable data will be removed from the transcript to maintain confidentiality.

We have the following people who have joined us today: …

1. How did you experience giving feedback with the *My Hearing Explained* tool?

Note: A probe is only necessary if there is a lull in the discussion.
Present the My Hearing Explained tool during this question as a reference.

Free Probes	*Specific Probes*
• What else? • Does anyone have a different thought?	• In your opinion, what was your initial thought of the tool? • In your experience, what is the use of the tool within the clinical practice?

Approximate Time Allocation: 10 min

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2. How would you describe the clients understanding of their hearing ability when using the tool to provide feedback?

Free Probes	*Specific Probes*
• Can you elaborate further? • Can anyone think of anything else? • Can you tell me more?	• Can someone give an example of what stood out specifically?

Approximate Time Allocation: 10 min

3. How would you compare giving feedback with the audiogram to the *My Hearing Explained* tool?

Free Probes	*Specific Probes*
• What else? • Does anyone have a different thought?	• What is your experience with the terms used between the two tools? • What is your opinion about the imagery used between the two tools? • What is your experience of interaction with the client when using the tool compared to the audiogram?

Approximate Time Allocation: 10 min

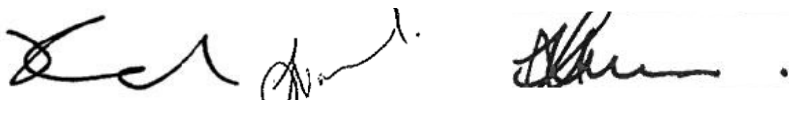
4. Is there anything else you would like to highlight or mention about the *My Hearing Explained tool?*

Free Probes	*Specific Probes*
• What else? • Does anyone have a different thought? • Can you elaborate further? • Can anyone think of anything else?	• Considering everything that was discussed today. What is your opinion that stands out the most about this tool?

That concludes our focus group discussion. Thank you so much for sharing your thoughts and opinions with us.

Louise Nell

Researcher



Prof DW Swanepoel, Dr F Mahomed-Asmail, Mrs De Sousa

Supervisors

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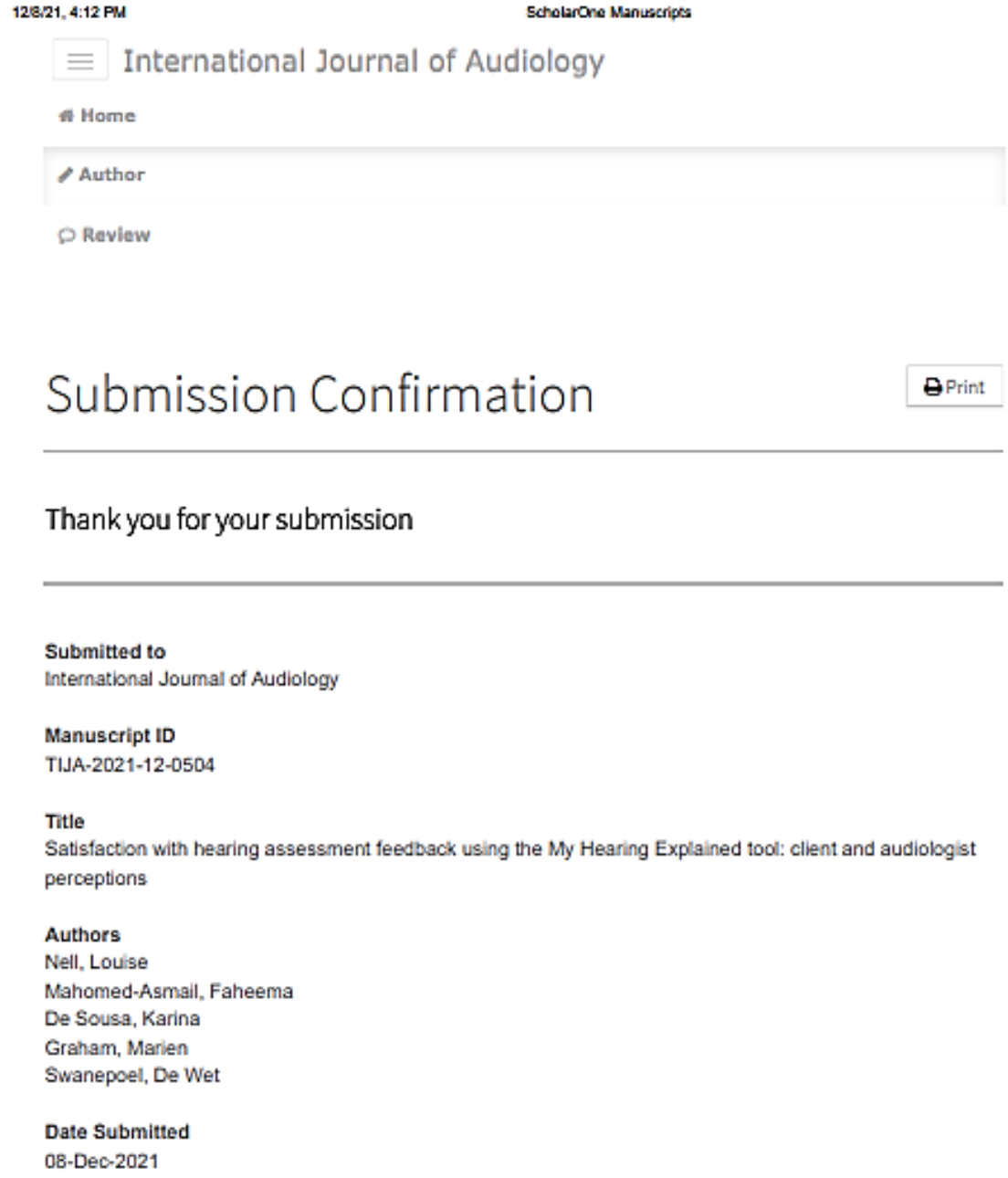
Appendix I: Proof of Article Submission



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International Journal of Audiology

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Submitted to
International Journal of Audiology

Manuscript ID
TIJA-2021-12-0504

Title
Satisfaction with hearing assessment feedback using the My Hearing Explained tool: client and audiologist perceptions

Authors
Nell, Louise
Mahomed-Asmail, Faheema
De Sousa, Karina
Graham, Marien
Swanepoel, De Wet

Date Submitted
08-Dec-2021

© University of Pretoria

MS: “Satisfaction with hearing assessment feedback using the My Hearing Explained tool: client and audiologist perceptions”
MS#: TIJA-2021-12-0504.R1

Dear Ms. Louise Nell:

Thank you for submitting your above-mentioned revised manuscript. Based on the reviewers’ recommendations, it is a pleasure to accept your manuscript for publication in the International Journal of Audiology.

Your manuscript will be sent to the publisher for the final production processes. Typically, a manuscript reaches formal electronic publication online in about 4 - 5 months. Page proofs and copyright release websites will be sent to you via email during part of the production phases. Please be sure to check your inbox and SPAM/Junk email folders (in case the email arrives in the wrong folder). It is very important that you navigate to the production website within a week of receiving the production email to read your page proofs carefully and submit corrections promptly to ensure your manuscript will be published on schedule. After you review your page proofs your article will be finalized and made available by navigating to the Taylor & Francis Early Online publication website with email announcements distributed globally. You and others will be able to view your article, along with the newest International Journal of Audiology online manuscripts at the website. Please keep in mind that the early online (electronic) publication of your article is considered formal publication with a unique assigned DOI.

We want to increase the impact of your article, and we work with authors to ensure your work reaches the widest possible (and most appropriate) audiences. Discover some simple yet effective ways to highlight your research at https://authorservices.taylorandfrancis.com/ensuring-your-research-makes-an-impact/.

Thank you for your fine contribution. On behalf of the Editors of the International Journal of Audiology, we look forward to your continued contributions to the Journal. Of particular importance is that you consider accepting the offer to review papers for IJA if/when asked. Finding seasoned authors to review papers is a critically important component of the peer review process and your assistance in this area would be most appreciated.

Sincerely,

Jackie L Clark, PhD
Managing Editor
International Journal of Audiology
jclark@utdallas.edu

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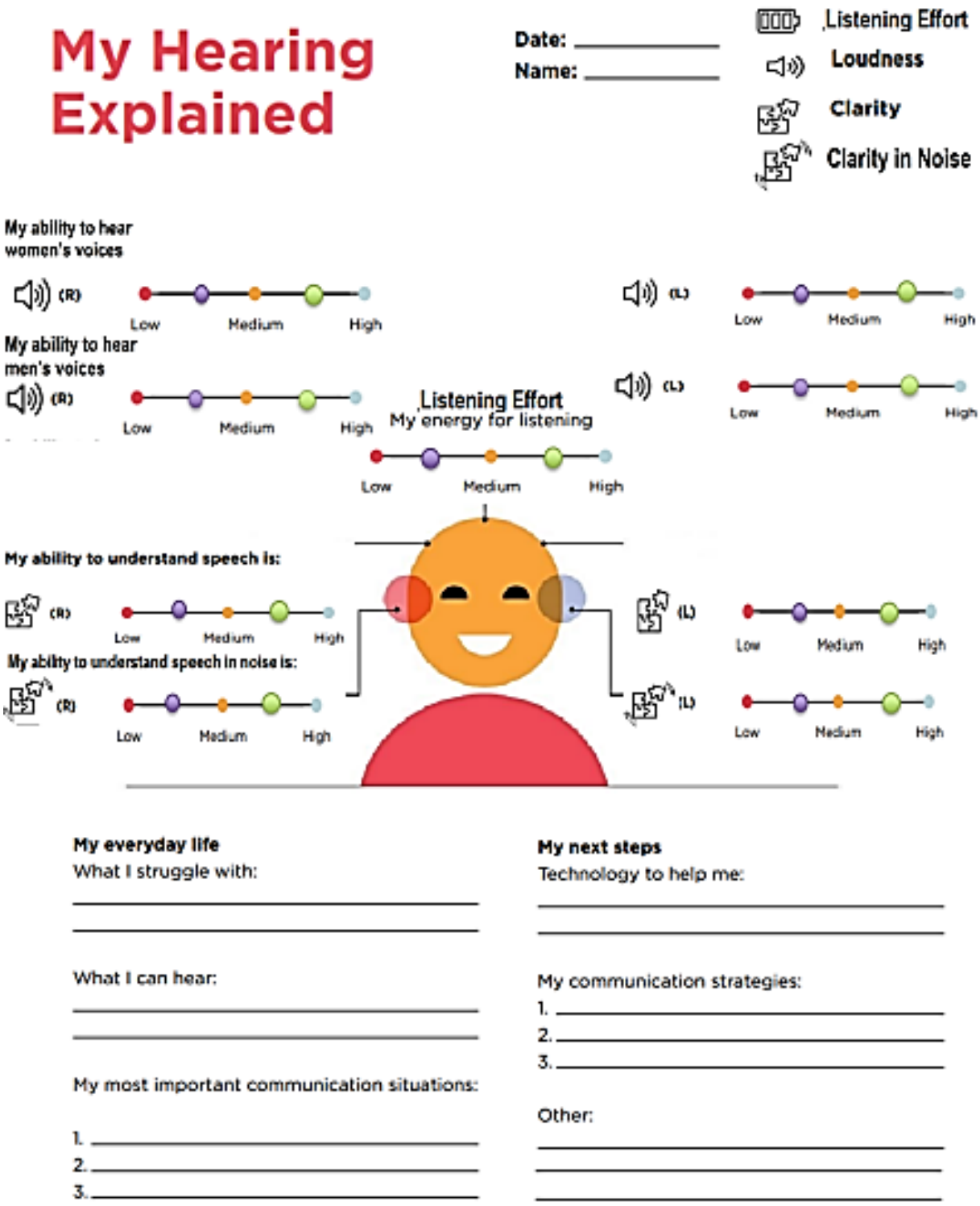
Appendix J: Recommended *IMHET* based on Audiologists Perceptions



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