

**Educational audiology service delivery in
South Africa:
Perceptions, practices and challenges of audiologists**

By

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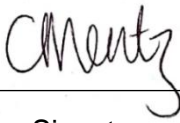
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LIST OF ABBREVIATIONS

EA – Educational audiology

HPCSA – Health Professions Council of South Africa

ABSTRACT

Aim: Educational Audiology (EA) is a relatively specialised field within audiology where audiologists play a crucial role in providing audiological services to school-aged learners with hearing loss. Audiologists in EA face numerous challenges, particularly in South Africa, where there is limited evidence regarding the provision of audiological services beyond hearing screening. As there is a limited number of trained professionals to provide EA services, audiologists cannot limit themselves to only providing audiological services in clinical settings. This study aimed to explore the perceptions and practices of South African audiologists in EA service delivery and the specific challenges they encounter.

Materials and methods: This cross-sectional study investigated the perceptions, practices and challenges of 64 audiologists registered with the Health Professions Council of South Africa (HPCSA) regarding EA service delivery. In the first phase, quantitative and qualitative data were collected through an online survey. In the second phase, a focus group discussion with four audiologists provided deeper insights into the emerging themes. Descriptive statistics and reflexive thematic analysis were used to analyse the data.

Results: Key roles identified for educational audiologists included serving as instructional team members, service coordinators, and consultants, with primary responsibilities in rehabilitation, device maintenance, and identifying hearing loss. A positive correlation ($p \leq 0.001$) was observed between the frequency of EA service provision and self-reported competency. EA services were predominantly offered in specialised educational settings, with challenges including language and cultural barriers, limited resources, financial constraints, and disengaged parents. Participants highlighted the need for increased training opportunities in EA within South Africa.

Conclusion: There is a perceived deficit of information regarding the roles and responsibilities of the educational audiologist in South Africa. It is crucial for audiologists to fully understand their roles and responsibilities in managing school-aged learners with hearing loss. Specifically, audiologists in private clinical practice must extend their responsibilities beyond the initial fitting of hearing aids to include comprehensive support for these school-aged learners with hearing loss, by providing information to the parents and teachers of these learners. This study underscores the need for the development of structured guidelines for delivering EA services in South Africa, as well as for enhancing learning opportunities within the field. Such measures could increase awareness of EA and positively impact service delivery in South Africa.

Keywords: Educational audiology; audiological service delivery; South Africa; Audiologists; Education

CHAPTER ONE: INTRODUCTION

“Children who hear acquire language without any particular effort; the words that fall from others' lips they catch on the wing, as it were, delightedly, while the little deaf child must trap them by a slow and often painful process. But whatever the process, the result is wonderful. Gradually from naming an object we advance step by step until we have traversed the vast distance between our first stammered syllable and the sweep of thought in a line of Shakespeare.” (Keller & Sullivan, 1903)

1.1 Audiology in South Africa

The scope of practice of qualified health professionals refers to the full range of services in which these health professionals are trained, have sufficient experience in- and are deemed capable of performing without overstepping their professional boundaries, with the ultimate goal of providing evidence-based services (Flynn, 2016). The extent of an audiologist's scope of practice, according to the HPCSA, entails diagnostic hearing assessments, management of hearing difficulties, appropriate referrals for advanced testing and/or surgery, collaboration with team members, assisting in appropriate educational/vocational placement, balance assessment (vestibular assessment and rehabilitation), monitoring of hearing status and hearing screening (HPCSA, 2020; Pillay et al., 2020). These services are dependent on the specific needs of patients, as patients' individual needs can differ significantly (Muñoz et al., 2020).

Audiology service delivery encounters numerous obstacles within South Africa's diverse racial-, cultural-, and multilingual context (Mothemela et al., 2024; Swanepoel, 2006). Specifically, a significant language- and cultural barrier often exists between audiologists and the clients they serve, irrespective of the audiological context (HPCSA, 2019a; Pascoe & Norman, 2011; Pillay et al., 2020; Swanepoel, 2006). It has also been documented that there are racial disparities between audiologists and their patients in South Africa (Mothemela et al., 2024). As the burden of disease is high among infectious diseases such as tuberculosis and HIV/AIDS (Mothemela et al., 2024), there is an even greater need for audiological services, as these diseases have been linked to hearing loss (Khoza-Shangase et al., 2022; Mothemela et al., 2024). Due to the burden of disease in South Africa, the emphasis in healthcare is primarily on life-saving interventions rather than on enhancing the quality of life (Khoza-Shangase, 2020; Mahomed-Asmail et al., 2016a; Pillay et al., 2020). Despite the prevailing focus on immediate life-saving measures, audiologists and speech-language therapists remain indispensable, as they are dedicated to improving communication, an essential aspect of overall well-being (Khoza-Shangase, 2020; Narsai et al., 2021; Swanepoel, 2006). A

decrease in the ability to communicate has adverse effects on mental health and the ability to learn, and it can lead to social isolation (Pascoe & Norman, 2011; Yousuf Hussein et al., 2018). When compared to international contexts, audiological service delivery in New Zealand faces challenges similar to those in South Africa, including financial constraints, a shortage of audiologists, and cultural differences (Boseley et al., 2023). In the United States, collaboration among healthcare professionals has been identified as a significant challenge for audiologists providing services in educational settings (Rashid et al., 2022). Similarly, in India, audiologists report difficulties related to the limited availability of trained professionals and the large proportion of the population residing in rural areas with little to no access to hearing healthcare (Davies, 2018).

There is a well-documented shortage of hearing healthcare professionals in South Africa (Bhamjee, le Roux, Schlemmer, et al., 2022; Donohue & Bornman, 2018; Mothemela et al., 2024; Pascoe & Norman, 2011; Swanepoel, 2006), as of April of 2023, the (HPCSA, 2023) reported a total of 971 audiologists (AU) and 1616 dually qualified speech-language therapists and audiologists (STA) actively registered for practice. There is a well-documented shortage of hearing healthcare professionals in South Africa (Bhamjee, le Roux, Schlemmer, et al., 2022; Donohue & Bornman, 2018; Mothemela et al., 2024; Pascoe & Norman, 2011; Swanepoel, 2006), and in April of 2023, the (HPCSA, 2023) reported a total of 971 audiologists (AU) and 1616 dually qualified speech-language therapists and audiologists (STA) actively registered for practice. This supports the notion that audiologists need to adapt and perform their roles in multiple contexts. The precise extent to which audiologists actively provide EA services within the educational landscape remains a question of critical significance. Evidence on the challenges South African audiologists face in providing EA services is scarce. This is compounded by South Africa's upper-middle-income status (Jobarteh, 2024), characterized by poverty, low socio-economic conditions, and limited teaching resources (Khoza-Shangase, 2020; Pillay et al., 2020) and teaching resources are limited (Narsai et al., 2021; Pillay et al., 2020). Among 2171 South African hearing healthcare professionals, only 26 (1.2%) reported working in non-clinical roles, such as research, policy, or management, with a ratio of 0.57 professionals per 10,000 people (Pillay et al., 2020). These findings underscore a shortage of specialised professionals and the need to investigate audiologists' engagement in EA service provision.

1.2 Educational landscape in South Africa

South Africa endeavours to establish an inclusive education system, wherein the vision encompasses integrating learners with diverse disabilities, including those with hearing loss, into mainstream educational institutions (Walton et al., 2015), with sufficient support to reach

their potential (Department of Basic Education, 2001, 2014, 2020a; Wium & Louw, 2015). This implies that school-aged learners with hearing loss or hearing problems such as auditory processing disorders, should have access to on-site audiological services (Johnson & Seaton, 2021) and regular hearing screenings to aid their integration into mainstream schools (Department of Basic Education, 2020b; HPCSA, 2018). The Department of Basic Education (2020)a stated that there are currently 501 school-going learners with specific (special) educational needs in South Africa and 121 461 school-aged learners with different disabilities in these schools. Enrolments in these schools have increased significantly throughout the years (Department of Basic Education, 2020a). This indicates that some progress has been made to provide for the needs of school-aged learners with specific educational needs, including hearing loss, and that these learners have access to specialised education. A school-aged learner with hearing loss could potentially be placed in a mainstream educational setting within reach of an audiologist who can provide necessary services. However, inclusive education in South Africa has not yet been fully realised (Donohue & Bornman, 2018; Naicker, 2018). Several factors contribute to excluding learners with hearing loss from mainstream schools. One significant issue is insufficient support from relevant specialists within the mainstream educational environment (Department of Basic Education, 2020a; Donohue & Bornman, 2018).

Meeting the educational needs of school-aged learners with hearing loss in this South African context of inclusive education is challenging, as teachers already bear significant responsibilities in educating typically hearing learners in the mainstream environment (Joubert et al., 2017; Timmer et al., 2023). Teachers in mainstream and specialised education settings are also confronted with additional issues, such as overcrowded classrooms and disciplinary concerns (du Plessis & Letshwene, 2020). (Storbeck & Martin, 2010) suggests that the Department of Basic Education in South Africa lacks sufficient oversight in appointing teachers for schools catering to students with hearing loss. Consequently, some appointed teachers may have limited experience dealing with learners with hearing loss. To provide effective instruction to a child with hearing loss, a teacher requires smaller class sizes, minimal background noise, non-reverberant surfaces and proximity to the child (Adebayo et al., 2020; HPCSA, 2023). The collaborative involvement of educational audiologists can elevate the standard of education for school-aged learners with hearing loss, potentially resulting in academic excellence (Adebayo et al., 2020; Johnson & Seaton, 2021). In contrast, if educational audiologists are not part of the team managing a learner with hearing loss, teachers might not have access to information on how to support the school-aged learner with hearing loss (du Plessis & Letshwene, 2020; Johnson & Seaton, 2021) and these learners will not reach their full academic potential. In South Africa, there are very few posts for audiologists

in schools (Rutherford, 2017), which leads to a dearth of information regarding the service delivery of EA. No published, statistical evidence was found regarding the state of permanent positions for audiologists in schools. Audiologists are also a vital part of the team when choosing a mode of communication (Johnson & Seaton, 2021) and supporting the teacher to ensure the learner with hearing loss in the mainstream or specialised educational environment has optimal access to instruction. The need for EA in South Africa is born out of the needs of school-aged learners with hearing loss and teachers needing the support of a hearing care professional (Pottas, 2015).

1.3 Educational audiology in South Africa

EA refers to any audiological services being provided to school-aged learners, specifically in the educational environment (Johnson & Seaton, 2021; Pottas, 2015). The aspects included in EA are hearing loss prevention by promoting hearing health, hearing screening and assessment to identify school-aged learners with hearing loss and/or auditory processing disorders to optimise the school-aged learners' outcomes, collaboration with other professionals, training of teachers, habilitation/rehabilitation, monitoring the progress of school-aged learners with hearing loss, making recommendations for classroom accommodations, providing amplification for the child and being an advocate for the learner with hearing loss (Johnson & Seaton, 2021; Kornak, 2019; Webster, 2019). The aim is to identify school-aged learners with hearing loss and/or auditory processing disorders, monitor their progress, make recommendations for classroom accommodations and provide amplification (Johnson & Seaton, 2021; Kornak, 2019; Webster, 2019). All these aspects aim to provide school-aged learners with hearing loss with the best opportunity for remediation and rehabilitation and to minimise the negative impact of hearing loss on their development (South African Speech Language and Hearing Association (SASLHA), 2011).

EA forms part of audiologists' undergraduate training globally. However, in some countries, an additional course or a post-graduate qualification must be completed in order for audiologists to provide EA services (Rosenberg, 2016). EA services are provided in developed countries like the United Kingdom, the United States of America and Ireland, as well as in developing countries like India (Ash, 2021; Miles & McCracken, 2008). In the United Kingdom, educational audiologists work either in the educational setting or within the National Health Service (Ash, 2021). In the United States of America, audiologists who want to qualify as an educational audiologist, must complete an additional two-year postgraduate diploma (Rosenberg, 2016). In Ireland, deaf school-aged learners are supported by specialist audiology services provided by audiologists and Teachers of the Deaf, and whether they are placed in a mainstream or specialised school, they receive weekly services from a visiting

qualified Teacher of the Deaf (National Council for Special Education, 2011). In India, undergraduate audiologists receive exposure to working with deaf and hard-of-hearing school-aged learners in specialised schools. Still, similar to the requirements for audiologists in South Africa, they do not require an additional qualification to practice as educational audiologists (Perepa, 2018). It is crucial to emphasise that audiologists practising in South Africa possess optimal qualifications to provide EA services. The service delivery of audiology varies, depending on the specific context of the country where it is being provided and what the capacity is of the specific country to have a specialised workforce (Hlayisi et al., 2024).

In South Africa, EA forms part of audiologists' undergraduate training, and an additional qualification/degree/certification is not required (ASHA, 2001; Department of Health, 2011; McNamara & Macione, 2011). The HPCSA indicate the provision of services within the educational context as part of the audiologist's scope of practice (HPCSA, 2019c). Managing a child with hearing loss encompasses more than just fitting hearing devices in the clinical sense (Johnson & Seaton, 2021; Webster, 2019). Specifically, the impact of hearing loss on the child's education must be determined (Johnson & Seaton, 2021). Having an audiologist as part of the management team for school-aged learners with hearing loss will provide the child with more opportunities in the educational context (Pottas, 2015). Thus, audiologists can help close the gap between the disciplines of education and audiology.

1.4 Importance of audiology services in the context of education and learning

Compared to their peers with normal hearing, school-aged learners with hearing loss are likely to have reduced access to language during their early years (Scott & Dostal, 2019). This can lead to delayed language development, which, in turn, can impact the future academic success of school-aged learners with mild to moderate sensorineural hearing loss (Halliday et al., 2017; Kornak, 2019; Scott & Dostal, 2019). Worldwide, the aim is to identify all children with hearing loss as early as possible and fit these children with appropriate hearing devices before six months of age (The Joint Committee on Infant Hearing (JCIH), 2019). In South Africa, identification and implementation services, also known as Early Hearing Detection and Intervention services, are not universally accessible, and at-risk infants are often diagnosed later than recommended (Bezuidenhout et al., 2018; Kanji, 2018). Delays in diagnosing hearing loss can cause school-aged learners with hearing loss to remain undetected until they start school, significantly affecting their developmental and educational outcomes (Mahomed-Asmail et al., 2016a).

The prevalence of hearing loss in school-aged learners globally is estimated to be approximately 4.0% (Olusanya et al., 2020), and the prevalence of hearing loss amongst school-aged learners in South Africa is estimated to be 2.2% (Mahomed-Asmail et al., 2016a).

There are approximately 43 schools for the Deaf in South Africa (*List Of Deaf Schools In South Africa - 2023/2024*, 2023; Storbeck, 2023), which underscores the necessity for tailored educational environments to accommodate learners with hearing loss. School-aged learners with hearing loss require supplementary assistance to thrive academically. The needs of a child with hearing loss determine what role the involved audiologists will fulfil (Johnson & Seaton, 2019), not only in terms of clinical audiology but also audiological service delivery in the educational context (Kornak, 2019). When managing school-aged learners with hearing loss, audiologists are often involved from their primary diagnosis, right through their school placement and annual monitoring, making them valuable members of the team when working with teachers of school-aged learners with hearing loss (Pottas, 2005; Van Dijk, 2003).

Internationally, audiological service delivery in specialised- and mainstream educational settings faces some challenges as literature has demonstrated that these challenges might include audiologists having minimal contact with teachers due to the need for audiological services in these educational settings not often being apparent (Johnson & Seaton, 2021). This means that audiologists still need to advocate for the importance of audiological service delivery to prevent their posts from being cut (Johnson & Seaton, 2021; Kornak, 2019). The management team for school-aged learners with hearing loss extends beyond teachers, parents and audiologists, encompassing other healthcare professionals such as speech-language therapists, occupational therapists, psychologists and school administrators (Kornak, 2019). The significance of educational audiologists is highlighted in providing ongoing support to learners with hearing loss and effectively collaborating with all relevant stakeholders.

According to the White Paper on Inclusive Education in South Africa, there was an estimated total of 383 408 school-aged learners with a hearing disability in 2001, which accounted for about 14.4% of people living with disabilities (Department of Basic Education, 2001). Keeping the goal for South Africa to move toward a more inclusive education system, a 20-year plan was devised, and a new report was expected in 2020, but that report has not yet been published (Department of Basic Education, 2001; Donohue & Bornman, 2018). In December 2014, a Screening, Identification, Assessment and Support policy was approved to identify learners requiring additional support to integrate into mainstream schools and to include hearing and vision screening as a requirement in schools (Department of Basic Education, 2020a). According to the HPCSA (2018), hearing screening by an audiologist or trained professional should be done at least once every four years as the learners move on to a new educational phase (HPCSA, 2018). This should be done to prevent permanent hearing loss and poor academic performance (Johnson & Seaton, 2021; Pottas, 2015; South African

Speech Language and Hearing Association (SASLHA), 2011). Recently, significant efforts have been made to enhance access to hearing healthcare services for school-aged learners in South Africa by employing mobile health (mHealth) technology and training community healthcare workers to perform hearing screening (Frisby et al., 2022; Mothemela et al., 2024; Swanepoel et al., 2014; Yousuf Hussein et al., 2018). Mhealth technology aims to provide access to audiological services to people who specifically live in low-and middle-income countries (Frisby et al., 2022). This ensures increased access to hearing screening and could help address the standard set by the HPCSA for hearing screening being done at least every four years for a school-aged learner.

1.5 Problem statement and rationale

The scarcity of practicing professionals in the field of EA (Bhamjee, le Roux, Schlemmer, et al., 2022; Mothemela et al., 2024; Pillay et al., 2020; Swanepoel, 2006) and the potential unmet needs of school-aged learners with hearing loss warrant a systematic exploration of the roles and activities undertaken by audiologists, with the ultimate aim of optimising the educational support afforded to this vulnerable population. Considering these aspects, it becomes imperative to determine the perceptions and practices of audiologists in the realm of EA service provision in South Africa as well as the specific challenges that they encounter. There is a dearth of comprehensive information on integrating routine audiology services within the educational system, leading to insufficient support for learners with hearing loss in educational environments. Untreated hearing loss can result in delayed language and cognitive development (Department of Basic Education, 2010; South African Council for Educators (SACE), 2020; Yousuf Hussein et al., 2018), learning and behavioural problems (Jalali et al., 2020), poor literacy skills, low self-esteem and poor social skills (Kornak, 2019; World Health Organization (WHO), 2016), all of which negatively impact academic success. Collaborative efforts between audiologists, teachers, parents of school-aged learners with hearing loss and other healthcare professionals are essential for improving educational outcomes and cognitive development for learners with hearing loss (Dimitrov & Gossman, 2023; du Plessis & Letshwene, 2020; Johnson & Seaton, 2021). Interprofessional teamwork is essential to managing a school-aged learner with hearing loss (Dimitrov & Gossman, 2023). The audiologist should ensure that the entire team is part of the rehabilitation process (Johnson & Seaton, 2021). Parents and primary caregivers of school-aged learners with hearing loss are often the learner's primary case managers (Johnson & Seaton, 2021) and need enough information from relevant team members to make informed decisions. Parents also encounter various challenges like finances (Bhamjee et al., 2019) and scheduling conflicts (Schmulian & Lind, 2020), which could impact the efficacy of the rehabilitation

process if these challenges are not addressed. The aim of this study was to describe the perceptions, practices and challenges of audiologists regarding EA service delivery in South Africa.

Therefore, the question arises: *What are the perceptions, practices and challenges of South African audiologists regarding service delivery in EA?*

CHAPTER TWO: METHODOLOGY

2.1 Research aim

The aim of this study was to describe the perceptions, practices and challenges of audiologists regarding EA service delivery in South Africa.

2.2 Research design

This study utilised a descriptive mixed-method research design. It comprised a two-phase process: Phase one involved an online self-administered electronic survey and Phase two included an online focus group discussion. For each phase, data was collected at a single point in time (cross-sectionally) (Brink et al., 2018; Thompson & Panacek, 2007). The results of the two phases were then combined during the interpretation.

The survey aimed to gain insight into the perceptions, practices and challenges of audiologists regarding the service delivery of EA. Electronic surveys are characterised as being more cost-efficient and generating faster responses when compared to paper-based surveys (Fang et al., 2013; Nayak & Narayan, 2019). Online surveys also facilitate easier data analysis (McPeake et al., 2013). Furthermore, online surveys yield fewer mistakes and blank items than paper-based surveys and more respondents are reached over a greater geographical area (Nayak & Narayan, 2019). However, it is essential to note that online surveys often have lower response rates and are more prone to selection bias (McPeake et al., 2013). To combat this potential for poor response rates, the survey was designed to be completed in about 10 minutes. Designing surveys to be completed in 10 minutes or less has been shown to increase the response rate of participants (Sammur et al., 2021).

The online focus group qualitatively enriched and enhanced the data obtained from phase one, providing more detailed insights into audiologists' perceptions and -practices regarding EA service delivery, potentially informing evidence-based practice. By using focus group discussions, a deeper understanding of participants' perceptions and reasoning concerning EA service delivery was achieved (Morgan, 2019).

This study applied methodological triangulation, utilising both qualitative- and quantitative data collection methods to ensure accurate conclusions and mitigate researcher bias (Brink et al., 2018). This approach helped neutralise potential biases from phase one and ensured that the researcher did not influence audiologists' perceptions.

2.3 Ethical considerations

The South African Guiding Principles for Ethical Research (2015) and the Ethical Guidelines for Health Researchers (2016) served as the foundational guidelines to maintain ethical practice in conducting this study. Ethical clearance for this study was obtained from the Research Ethics Committee of the Faculty of Humanities, University of Pretoria, South Africa (HUM039/0621) (Appendix A). The following ethical principles were considered in the study design, participant selection, consent procedures, data collection, and data storage in this study (Table 2.1):

Table 2.1

Ethical Principles and Application in This Study (Brink et al., 2018; Department of Health, 2015; HPCSA, 2016; Leedy & Omrod, 2015; Pietilä et al., 2020)

Ethical Principle	Application in this study
Informed consent Obtaining informed consent is crucial as participants must understand the research study's scope and their involvement before agreeing to participate (Owonikoko, 2013).	An informed consent letter (Appendix B) outlining the purpose and procedures of the study was provided to the South African Speech-Language and Hearing Association (SASLHA), the South African Association of Audiologists (SAAA) and the Audiology Private Practice Forum (APPF) to request permission to distribute the online survey on their platforms. Following consent from SASLHA, SAAA, and APPF (Appendix C), the survey link, along with an informed consent letter for prospective participants (Appendix D) was distributed. Participants in Phase one were required to click a "click to accept" button on the first page of the survey, which contained the study information (Appendix D). Upon completion of the survey (Appendix E), participants could indicate their willingness to participate in a focus group discussion by answering "Yes" or "No" to the final question. Only those who consented were contacted via email by the researcher, where they had the opportunity to consent to participate in Phase two of the study. Participants were informed that they could withdraw from the study at any time without negative consequences.
Respect for people (Dignity and autonomy) Participants must be respected and treated with dignity, and their rights must be respected and upheld at all times.	Participants made autonomous decisions based on the provided study information (Appendix D) without any coercion or influence from the researcher. All participants were treated equally and without discrimination.
Right to privacy (Confidentiality)	The only identifying information required was participants' email addresses, used to remove specific participants' information upon withdrawal and to contact them for phase two participation. While

<p>Participants' privacy must be respected unconditionally. No identifying information of any participants may be shared with anyone other than the participants themselves and co-researchers who are significantly involved in the investigation.</p>	<p>anonymity could not be guaranteed, participants' information was kept highly confidential in a password-protected folder accessible only to the researcher (Kang & Hee-Joong, 2023). Each participant was assigned an alphanumerical code upon completion of the survey to ensure confidentiality during the process of analysing and reporting on the data. The informed consent letter (Appendix D) assured participants of maintaining confidentiality throughout the data analysis process. Participants could opt to switch off their video during focus group discussions. Recordings were only accessible to the researcher and supervisors, with no identifying information included in data analysis and discussion.</p>
<p>Protection from harm</p> <p>The ethical principle of “beneficence” ascertains that participant in a research study needs to be protected from harm when a research study is being conducted. The risks should never outweigh the benefits and should not exceed those of daily living.</p>	<p>As online surveys and online focus groups were the primary methods of data collection (Appendices E and F), participants were informed via the informed consent letter (Appendix D) of their right to voluntarily participate and withdraw without negative consequences. Consequently, no risks were associated with participating in this study.</p>
<p>Plagiarism</p>	<p>A declaration was signed to confirm that all research conducted was original and not a copy of another's work. To avoid plagiarism, the researcher cited all the sources used to support this study, paraphrased, and submitted the final document through Turnitin, which helped to prevent plagiarism.</p>
<p>Storage of data</p>	<p>Upon completion of the study, all relevant data was stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for ten years, as per the University's policy on data storage (Appendix G). The data will also be uploaded unto Figshare, the University of Pretoria's research data repository. Obtained data may be used in future research projects, as</p>

	<p>specified in the informed consent letters (Appendix D). After the ten-year period has passed, the primary researcher or the head of department of Audiology and Speech-Language Pathology will request that the department of information technology services to destroy the research data, which is stored on the institutional research data management system.</p>
Release of findings	<p>The final research dissertation will be available in the University of Pretoria's online library. The study results will be used in a research article submitted to an accredited peer-reviewed journal and may be presented at conferences.</p>

2.4 Research participants

This section will provide an overview of how participants were selected and describes their key demographic characteristics.

2.4.1 Participant selection criteria

To be included in this study, participants had to meet the following criteria:

Qualification and registration: Participants must be registered with the HPCSA as an Audiologist (AU) or Speech Therapist and Audiologist (STA).

2.4.2 Participant selection procedures

For phase one, audiologists were recruited through SASLHA, SAAA and APPF using purposive sampling, as participants were selected non-randomly and needed to adhere to a specific criterion (Brink et al., 2018; Etikan et al., 2016). Initially, 104 audiologists consented to participate and completed an online survey. To ensure data reliability, participants who only completed the biographical section or spent less than five minutes on the survey were excluded (Eysenbach, 2004). The final sample for Phase one comprised 64 audiologists. A minimum of 60 participants was determined necessary for Phase one, based on *a priori* power analysis for statistical significance (Faul et al., 2007). Only participants who participated in Phase one and indicated their willingness to participate in Phase two were eligible to participate in Phase two.

In Phase two, 17 audiologists who completed the online survey (Phase one) indicated their willingness to participate in a focus group discussion. Invitations were subsequently sent via email, resulting in six responses. Ultimately, four audiologists participated in the online focus group discussion, which was conducted via Microsoft Teams (Nyumba et al., 2018).

2.4.3 Description of participants

The final study sample included 64 audiologists working across all nine provinces of South Africa. Most respondents (62.5%) work in Gauteng, followed by KwaZulu-Natal and Western Cape (9.4% each). Three audiologists work in Mpumalanga and Northwest (4.7% each) and one audiologist (1.6%) work in Free State, Northern Cape and Western Cape respectively. Most participants (68.8%) have obtained a bachelor's degree as their highest qualification, while a few (25%) have a master's degree, and some (6.3%) have a Doctoral degree. With regards to work-setting, twenty-seven audiologists (42.2%) primarily work in a government hospital/clinic, while twenty (31.3%) work in a private practice. Seven audiologists (10.9%) work in an educational setting while eight (12.5%) work in academia. One (1.6%) works as an audiological representative for a company and another one (1.6%) works in a corporate

setting. The average number of years that the participants have been practicing as an audiologist is 7.5 years. In Phase one, the experience of practising audiologists ranged from less than one year (currently completing community service) to 35 years (mean = 7.5 years, SD = 8.70). The majority of participating audiologists (85.9%) reported regular involvement with paediatric cases in their daily caseload.

For Phase two, three participating audiologists were based in Gauteng, while one worked in the Western Cape Province. All the audiologists who participated in Phase two held bachelor's degrees; two worked in a government hospital/clinic, one in private practice, and one in an educational setting.

2.5 Data collection material and equipment

2.5.1 Survey

A self-developed online survey (Appendix E) was used to collect data for Phase one, using the Qualtrics™ XM online platform, as no standardised survey exists to obtain information about EA. The survey was compiled utilising established literature and protocols related to hearing screening for school-age children and EA (Ash, 2021; HPCSA, 2018, 2019c; Johnson & Seaton, 2021; Pillay et al., 2020; Pottas, 2015; Swanepoel, 2006). See Table 2.2 for a more detailed explanation of the included content.

Table 2.2

Literature Sources and Survey Development

Reference	Section/ Question included	Format of questions	Justification
(Hughes et al., 2016) (Pillay et al., 2020)	Demographic characteristics (Section A: Questions 1 to 5; 5 questions)	Check box/ Open-ended	South Africa has a very diverse population and to provide context for this study's findings, it is essential to characterise participants' demographics.
(Johnson & Seaton, 2021) (Ash, 2021) (Van Dijk, 2003)	Defining EA (Section B: Questions 1 to 2; 2 questions)	Open-ended	To understand participants' perceptions regarding EA, it is essential to ascertain their definitions and perceptions of what constitutes an educational audiologist.

(Johnson & Seaton, 2021) (HPCSA, 2019b)	Roles and responsibilities of the educational audiologist (Section B: Questions 3 to 4; 2 questions, 20 sub-sections)	Likert scales	It is vital to gauge participants' level of agreement on the roles and responsibilities of an educational audiologist, as this is directly linked to their perceptions regarding EA.
(Johnson & Seaton, 2021) (HPCSA, 2020) (HPCSA, 2018)	Frequency of EA service provision and self-reported competency (Section B: Question 5; 1 question)	Check box/drop-down list	Participants' own experiences with providing EA services help contextualise their responses and enhance the validity and reliability of the study.
(Swanepoel, 2006) (Mothemela et al., 2024) (Bhamjee, le Roux, Schlemmer, et al., 2022) (du Plessis & Letshwene, 2020)	Challenges experienced in EA (Section B: Questions 7 – 9; 3 questions)	Check box/ Open-ended	South Africa has limited resources where healthcare professionals face many challenges in service provision, and it is necessary to understand what challenges audiologists face when providing EA services.
(Rutherford, 2017)	Community service post for EA (Section B: Question 6; 1 question)	Drop down list	South Africa has a community service system for healthcare professionals after graduating. This community service is currently only being done in clinical settings.

The survey (Appendix E) was used to collect demographic information and obtain participants' perceptions and practices regarding the service delivery of EA, and the challenges that they encounter in EA service delivery. Comprising two open-ended and eight closed-ended questions distributed across different sections.

2.5.2 Pilot study

To ensure the content validity and reliability of the survey used in this study, a pilot study was conducted (Brink et al., 2018). Three audiologists practicing within the field of EA participated in the pilot study. They received an informed consent letter (Appendix D) detailing the study procedures. These audiologists were contacted by the primary researcher and the supervisor directly to request participation in this pilot study. The survey was then emailed to these audiologists, and they were asked to comment on aspects such as relevance, clarity, flow, length and question content and wording. Feedback was provided, with one audiologist giving detailed input, another offering a single comment and one expressing overall satisfaction. The survey was adjusted based on their input to address all identified aspects. The content validity index (CVI) for the final version was found to be 1, as all audiologists in the pilot study were in agreement, which, according to (Yusoff, 2019), is an acceptable CVI value and ensures the content validity of the survey (Yusoff, 2019). The summary of the feedback from the pilot study participants and how it was addressed, is provided in Table 2.3.

Table 2.3*Adaptions made to the survey based on pilot study results.*

Aspect	Question	Original questions and comments	Adaptation
Content	Section A Question 4	“What is your primary work setting currently? Select all applicable options” “There is an extra box without anything written next to it.”	“Add an “s” to ‘service” The extra box was deleted.
	Section A, Question 5:	“How many years have you been practising as an Audiologist? Indicate in years” “Remove ‘Indicate in years’ in the question.”	“Indicate in years” was deleted.
	Section B, Question 1:	“How would you define educational audiology service delivery?” “This question is a little ambiguous for me. I’m not sure how I’d answer or what specifically you’re looking for here. Also, educational audiology service delivery would depend on what setting the audiologist works in. A private practitioner providing services to a school would differ from a therapist employed at a school.”	The adaptation was made, and the question now reads: “In your own words, how would you define educational audiology service delivery? (Irrespective of your current primary work setting)”
	Section B, Question 3	“Is school-aged children (Grade R – Grade 12) part of your caseload?” “Replace ‘Is’ with ‘Are’”	“Is” was removed. The question now reads: “Are school-aged children (Grade R – Grade 12) part of your caseload?”

	Section B, Question 4 Likert scale 2 sub- question 5:	<p>“It is the responsibility of the educational audiologists to facilitate group activities with Deaf/ hard of hearing peers.”</p> <p>“‘Hard of hearing’ should be written in capitals. Replace Deaf/Hard of hearing with ‘learners with hearing loss’.”</p>	<p>The spelling was corrected. The question now reads: “It is the responsibility of the educational audiologists to facilitate group activities with learners with hearing loss.”</p>
	Section C, Question 9	To what extent do you agree that your undergraduate degree provided you with sufficient training to provide audiological service in schools?	Question now reads: “To what extent did your undergraduate training equip you to provide audiological services in schools?”
Clarity	Section B Question 5 Sub- question 3:	<p>“Please indicate whether you have experience providing the following services to school-aged children, and if so, how often do you provide this service?”</p> <p>“Providing observations in classrooms”.</p> <p>“This is a bit ambiguous to me. Providing observations to who? To students? Or do you mean demonstrating use of assistive devices to teachers?”</p>	<p>This question was deleted as it is a repetition of a question already asked.</p>

Section B Question 5 Sub- question 4:	<p>“Please indicate whether you have experience providing the following services to school-aged children, and if so, how often do you provide this service?”</p> <p>“Collaboration with other health professionals (e.g., speech-language therapist at school)”</p> <p>“Omit ‘in school’ and add example for clarity.”</p>	<p>The question was changed to:</p> <p>“Collaboration with other health professionals (e.g., speech-language therapist)”</p>
Length	None	None
Appropriateness of questions	None	None

2.5.3 Focus group guide

A focus group guide (Appendix F) was utilised to ensure that the focus groups were semi-structured and to guide the discussion on the service delivery and perceptions of audiologists regarding EA (Bhamjee, le Roux, Swanepoel, et al., 2022). The focus group guide contained five open-ended questions probing audiologists on themes related to the research aim as well as themes that emerged from Phase one of this study. These questions included the definition of EA (Ash, 2021; Johnson & Seaton, 2021; Van Dijk, 2003), challenges that the service delivery of EA faces in South Africa (Bhamjee, le Roux, Schlemmer, et al., 2022; Mothemela et al., 2024; Swanepoel, 2006) as well as the participants' perceptions of the necessity of educational audiologists (Donohue & Bornman, 2018; HPCSA, 2018). The focus group guide also allocated specific timeframes for each question to ensure comprehensive discussion without extending participants beyond their initial commitment. This approach aimed to maintain focus and facilitate meaningful contributions from all participants.

2.5.4 Focus group equipment

A computer, headphones and Wi-Fi were utilised to conduct the online focus group. Participants were invited to the Microsoft Teams meeting via email, and they were reminded of the meeting on the day of the focus group. Microsoft Teams is a safe way to meet virtually as it is encrypted, and the data can be stored safely (Levy, 2021). Recording software on Microsoft Teams was used to record the focus group and to assist in the transcription, as Microsoft Teams has built-in transcription software. Participants were asked to share their videos to enhance the qualitative data analysis. Additionally, participants were let into the

Microsoft Teams meeting through a waiting room to ensure that only invited participants could attend (Keemink et al., 2022). Many people are familiar with the Microsoft Teams platform, as it has become a very widely used platform during the COVID-19 pandemic (Spataro, 2020) and it has become the recommended way for online communication by local authorities for people working from home (Keemink et al., 2022).

2.6 Data collection procedures

2.6.1 Phase one

Professional bodies SASLHA, SAAA, and APPF were initially contacted by phone and subsequently via email to seek their consent to distribute the online survey through their email platforms (Appendix B). Upon receiving permission (Appendix C), participants were recruited via these professional bodies' email distribution lists. Prospective participants received an email containing a link to the online survey (Appendix E). The first website page contained the informed consent form (Appendix D) as well as a "click to accept" button for participation. In this manner, the researcher was able to obtain informed consent from all participants who had completed the survey. Participants who declined consent were redirected to a thank-you page without accessing the survey. Recruitment also extended through word of mouth, social media platforms (Facebook, LinkedIn, WhatsApp) and personal contacts of the researcher.

To ensure data quality, participants were required to spend more than five minutes completing the survey and respond to at least 60% of the survey questions. This time threshold was chosen to allow participants to thoroughly understand and respond thoughtfully, thereby enhancing the credibility of the study's findings (Eysenbach, 2004). All responses were downloaded onto a Microsoft Excel spreadsheet to be analysed.

2.6.2 Phase two

Upon completion of the survey (Appendix E), participants had the option of answering "Yes" or "No" to the last question, asking them if they would be willing to be contacted to participate in a focus group discussion. Those who consented were subsequently contacted via email and informed consent letters were sent to them. Once to participants agreed, an email was sent to confirm participation details for specific dates and times. For focus groups to be conducted using online platforms, a stable internet connection is required, but when comparing online focus groups with in-person focus groups, online platforms are more cost-effective, participants may find it more convenient and the researcher will be able to conduct focus groups with audiologists from all over South Africa (Gray et al., 2020) without the added cost of travelling. Although there are multiple benefits to online focus groups, some limitations

could also include the inability to accurately observe participants' facial expressions and body language and participants' environment might have some distractions (Freeman et al., 2022).

Participants received invitations and reminders via email, and the focus groups were conducted using Microsoft Teams' recording feature for transcription purposes. Participants were asked to share their videos to enhance the qualitative data analysis. Additionally, participants were let into the Microsoft Teams meeting through a waiting room to ensure that only invited participants could attend (Keemink et al., 2022). Many people are familiar with the Microsoft Teams platform, as it has become a very widely used platform during the COVID-19 pandemic (Spataro, 2020), and it has become the recommended way for online communication by local authorities for people working from home (Keemink et al., 2022). The meeting was audio- and video recorded. The researcher transcribed these meetings verbatim post-meeting, and each participant was assigned an alphanumerical code to ensure confidentiality. During the meetings, the researcher, as well as one supervisor, took handwritten field notes to increase the accuracy of the transcriptions. The meeting recordings were stored electronically in a password-protected file to which only the researcher has access. The focus group discussion lasted about 60 minutes.

2.7 Data processing and analysis

2.7.1 Phase one

The data for this study was captured automatically onto an Excel spreadsheet, by the Qualtrics™ XM and subsequently exported to the Statistical Package for Social Sciences (SPSS) version 28 for analysis. Quantitative analysis involved descriptive statistics, such as frequencies, percentages, means (M), standard deviations (SD), medians (Mdn) and interquartile ranges (IQR). Inferential statistics, utilising nonparametric Spearman correlations (r_s), were employed due to the non-normal distribution of variables (Shapiro-Wilk p -values < 0.05) with correlation strength interpreted as weak when the absolute value is less than 0.1, weak to moderate when the absolute value is between 0.1 and 0.3, moderate to strong when the absolute value is between 0.3 and 0.5, and strong when $r_s \geq 0.5$ (Téllez et al., 2015). The open-ended questions from the survey were analysed qualitatively through reflexive thematic analysis (Braun et al., 2019; Byrne, 2021). Non-responses in the survey were captured as missing system values.

Data processing adhered to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (Appendix H), ensuring ethical compliance and methodological rigor in online survey implementation (Eysenbach, 2004). The CHERRIES relate to all ethical considerations within the electronic survey. The survey instrument, self-developed based on compiled

literature on school-age hearing screening, underwent rigorous testing for usability and functionality by the primary investigator, supervisors, and a statistician before distribution via email platforms, social media channels, and word of mouth. It was an open survey accessible without a password, distributed with approval from group administrators on social media and supplemented with invitations via WhatsApp (see Appendix I). Completion of this survey was entirely voluntary, and no incentives were provided. The survey was made available to participants between November 2022 and February 2023, and comprised 17 questions, with 15 being compulsory, due to adaptive questioning. Questions were not randomised, and the survey system flagged unanswered items. Participants had the opportunity to review and revise their responses before final submission. Qualtrics™ XM tracked IP addresses to prevent duplicate submissions. Metrics such as view, participation and completion rates were calculated according to CHERRIES guidelines. Responses completed in less than five minutes (40 in total) were excluded to ensure data quality, as this timeframe was deemed insufficient for thoughtful and accurate responses. No statistical corrections were applied post-data collection.

2.7.2 Phase two

The data obtained from phase two of this study was analysed qualitatively through a reflexive thematic analysis, a method chosen for its ability to interpret data in a logical and compelling way while acknowledging the researcher's subjectivity (Braun et al., 2019; Byrne, 2021). A reflexive approach was chosen as no themes will be developed prior to data collection; instead, codes emerged throughout the coding phase, allowing the researcher to engage deeply with the data to obtain rich information. The reflexive thematic analysis followed six steps (Byrne, 2021). First, the researcher became familiar with the data by doing the manual transcription of the focus groups and re-reading the transcriptions. Then, initial codes were generated from the transcriptions by using colour coding. Themes were then generated by the researcher, which were revised and refined by the study supervisor to represent the data accurately. Following this, themes and sub-themes were generated from the codes, providing meaningful insights into the perceptions, practices and challenges of audiologists regarding EA service delivery. A thematic map and tables were developed to associated codes with their respective themes (Byrne, 2021), with the study supervisor providing assistance in their creation. After this, potential themes were reviewed, and incongruent themes or those that did not add value to the research question were revised or removed. Defining and naming themes to provide a detailed thematic framework followed, selecting relevant extracts to illustrate various viewpoints, and reviewing final theme names. Finally, the report was produced, ensuring the emerging themes appeared in the correct order and were logically linked (Braun

& Clarke, 2012; Byrne, 2021). This reflexive thematic analysis informs future practice and offers professional insights into the field of EA (Lester et al., 2020).

2.8 Reliability and validity

2.8.1 Phase one

In order for any research results to be reliable and valid, the information obtained needs to be accurate within the context and yield consistent outcomes when applied by different researchers (Brink et al., 2018). Content validity refers to the instrument's ability to measure all components of the variable of interest (Brink et al., 2018). Various sources of literature were used to compile the content of the survey (Ash, 2021; Bhamjee, le Roux, Schlemmer, et al., 2022; du Plessis & Letshwene, 2020; HPCSA, 2019b; Hughes et al., 2016; Johnson & Seaton, 2021; Mothemela et al., 2024; Pillay et al., 2020; Rutherford, 2017; Swanepoel, 2006). Cronbach's alpha coefficients were calculated to establish the reliability of the survey (Appendix J). Cronbach's alpha is used to determine whether tests and scales that have been developed are dependable (Taber, 2018). All factors for the roles, as well as for the responsibilities of the educational audiologist, exhibited values above 0.6, confirming internal consistency, as a Cronbach's value above 0.6 can be deemed reliable (Hajjar, 2018).

To establish construct validity, Spearman correlations were calculated (Appendix K). Construct validity consists of convergent validity (items belonging to the same construct should correlate highly) and discriminant validity (items not belonging to the same construct should have low correlations) (Heale & Twycross, 2015). For conciseness, not all correlations are presented. For the roles of an educational audiologist, the correlations between items belonging to the same factor ranged from 0.368 to 0.572, and for the responsibilities of an educational audiologist, from 0.434 to 0.767, with all correlations being statistically significant ($p < 0.05$), thus establishing convergent validity. For discriminant validity, the correlations of items belonging to different factors are much weaker and not all are statistically significant, thereby establishing discriminant validity. One example is provided here. The correlation between V10: "Role: to train teachers to support learners with hearing loss", and V23: "Responsibility: Ensure learners' hearing devices are operating optimally", equals 0.130 with $p\text{-value} = 0.304 > 0.05$ (not statistically significant).

2.8.2 Phase two

The term "qualitative reliability" pertains to the consistency of study findings across different studies and different researchers (Brink et al., 2018). In qualitative research, reliability (also called "trustworthiness") relies on four criteria: credibility (truthfulness), dependability (evidence), confirmability (accuracy) and transferability (application) (Ahmed, 2024; Brink et

al., 2018; Lincoln & Guba, 1985). The credibility of this study was enhanced utilising research triangulation to mitigate researcher bias (Brink et al., 2018), involving the primary researcher and both supervisors. Data triangulation was achieved by incorporating both survey data and insights from the focus group discussion. Member checking was utilised during the focus group discussion to ensure that the primary researcher did not influence the responses with own biases (Birt et al., 2016) and thus, enhancing the confirmability of this study (Ahmed, 2024; Brink et al., 2018). Participants in the focus group responded well to member checking. The primary researcher used phrases like “Do I understand you correctly that...” and “So by saying..... you mean....”. Dependability was ensured by following the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Appendix L), which guided comprehensive reporting of study design aspects, thereby providing a clear audit trail of the research process (Tong et al., 2007). Transferability was supported through detailed descriptions of participant demographics and procedures (section 2.3.3) and the use of purposive sampling. Only audiologists registered with the HPCSA were eligible to participate, ensuring that findings are applicable within the context of South African audiologists specialising in educational audiology.

**CHAPTER THREE: Educational Audiology service delivery in South Africa:
Perceptions and practices of Audiologists.**

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3.1 Abstract

Purpose: Educational Audiology (EA) is recognised as a new field within audiology and is vital in providing audiological services to school-aged learners with hearing loss. Limited evidence exists on the EA service delivery in South Africa. This study aimed to explore the perceptions and practices of South African audiologists regarding EA service delivery.

Materials and methods: Using a cross-sectional design, the study engaged 64 audiologists in the initial phase through a quantitative survey, followed in the subsequent qualitative phase by a focus group discussion involving four audiologists in the subsequent qualitative phase.

Results: Audiologists concurred on the roles of educational audiologists as team members, service coordinators and consultants, with responsibilities including rehabilitation, device maintenance and identifying hearing loss. The frequency of EA service provision correlated with self-reported competency. Challenges included unengaged, economically strained parents, limited school resources and financial constraints in private practice. Audiologists also highlighted a lack of information and guidelines on EA.

Conclusions: The study underscores the necessity for a precise definition of EA and more learning opportunities within EA. While some audiologists may not provide EA services, teamwork, effective communication and specific suggestions for improvement are essential.

Keywords: Educational audiology; audiological service delivery; South Africa; Audiologists

3.2 Introduction

EA refers to all audiological services provided by audiologists to learners, specifically in the educational environment (Johnson & Seaton, 2021; Pottas, 2015). These services include hearing loss prevention by promoting hearing health, hearing screening and hearing assessment, (re)habilitation, collaboration with other professionals and training of teachers to be advocates for learners with hearing loss (Johnson & Seaton, 2021; Kornak, 2019; Webster, 2019). EA endeavours to identify hearing loss and/or auditory processing disorders, offer suggestions for classroom accommodations, and provide hearing devices such as hearing aids, cochlear implants, and other assistive technology to learners with hearing loss, while also monitoring their progress (Johnson & Seaton, 2021; Kornak, 2019; Webster, 2019).

Internationally, EA services are provided in developed countries like the United Kingdom and the United States of America, as well as in developing countries like India (Ash, 2021; Miles & McCracken, 2008). In certain countries such as the United Kingdom, the United States of America and Ireland, additional training or a post-graduate qualification must be completed for an audiologist to qualify as an educational audiologist (Rosenberg, 2016). In South Africa,

training in EA is integrated into the undergraduate curriculum of audiologists hence additional post-graduate training is not required (Department of Health, 2011; McNamara & Macione, 2011).

The HPCSA delineates the provision of services within the educational context as an integral component of the audiologist's scope of practice (HPCSA, 2019b). The specific role that audiologists will assume is contingent upon the identified needs of a school-aged learner with hearing loss (Johnson & Seaton, 2021). This role does not only include service delivery in clinical audiology, but also renders audiological services within the educational context (Kornak, 2019). The scope of EA service delivery encompasses a comprehensive approach that involves not only fitting hearing devices, but also assessing the educational impact of hearing loss on learners. This approach aims to effectively address the challenges posed by hearing loss within an educational context, striving for optimal outcomes (Johnson & Seaton, 2021; Stach & Ramachandran, 2017; Webster, 2019). By integrating audiologists into the management team for learners with hearing loss, there is a heightened potential for improving educational opportunities for these individuals (Pottas, 2015). Consequently, audiologists play a pivotal role in bridging the gap between the disciplines of education and audiology.

The prevalence of hearing loss among school-aged learners (five years to 18 years) in Sub-Saharan Africa is approximately 4.0% (Olusanya et al., 2020). The existence of 43 schools for the Deaf and Hard of Hearing in South Africa (*List Of Deaf Schools In South Africa 2024-2025 - Uni24.Co.Za*, n.d.; Storbeck, 2023) underscores the necessity for tailored educational environments to accommodate learners with hearing loss. School-aged learners with hearing loss require supplementary assistance to thrive academically. South Africa endeavours to establish an inclusive education system, wherein the vision encompasses integrating learners with diverse disabilities, including those with hearing loss, into mainstream educational institutions (Walton et al., 2015). The dedication is to ensure that, through inclusive education, these learners receive comprehensive support to actualise their full potential (Department of Basic Education, 2001, 2014, 2020c; Wium & Louw, 2015). This implies that school-aged learners with hearing loss or hearing problems such as auditory processing disorders should have access to on-site audiological services (Department of Basic Education, 2020b; Johnson & Seaton, 2021; Wium & Louw, 2015). Given the prevalence of hearing loss among school-aged learners and the unique needs of school-aged learners with hearing loss, audiologists must extend their services beyond the confines of traditional clinical settings.

Educational audiologists have many different roles and responsibilities that will contribute to the success in the educational setting of school-aged learners with hearing loss (Johnson & Seaton, 2021). According to the (HPCSA, 2018), hearing screening, conducted by

audiologists or trained professionals, should be done at least once every four years as learners move on to a new educational phase (HPCSA, 2018). Hearing screening should be done to prevent and identify any hearing loss and related poor academic performance (HPCSA, 2018; Johnson & Seaton, 2021; South African Speech Language and Hearing Association (SASLHA), 2011). There is a dearth of systematic published data regarding the status of hearing screening and follow-up services in schools and the subsequent audiological support for school-aged learners with hearing loss within the educational context in South Africa (Swanepoel, 2006). Recently, significant efforts have been made to enhance access to hearing healthcare services for school-aged learners in South Africa by employing mobile health technology and training community healthcare workers to perform hearing screening (Swanepoel, 2006; Swanepoel et al., 2014; Yousuf Hussein et al., 2018). However, there is still much work to be done to meet the established guidelines for hearing screening in schools (Donohue & Bornman, 2018).

Audiology service delivery encounters numerous obstacles within South Africa's diverse racial, cultural and multilingual context (Swanepoel, 2006). Specifically, there is a significant language and cultural barrier between audiologists and the clients they serve, irrespective of the audiological context (HPCSA, 2019b; Swanepoel, 2006; Swanepoel et al., 2014; Yousuf Hussein et al., 2018), which leads to patients being unable to receive services in their home language. In South Africa, where the burden of disease is high and the emphasis is mainly directed towards saving lives rather than enhancing quality of life (Donohue & Bornman, 2018; Mahomed-Asmail et al., 2016a; Yousuf Hussein et al., 2018), audiologists and speech-language therapists play pivotal roles in the healthcare workforce. Despite the prevailing focus on immediate life-saving measures, these professions remain indispensable, as they are dedicated to improving communication (which could be impacted due to hearing loss) which is an essential aspect of overall well-being (Swanepoel, 2006). Research has shown that a decrease in the ability to communicate has adverse effects on mental health and the ability to learn, and it can lead to social isolation (Pascoe & Norman, 2011; Yousuf Hussein et al., 2018). There is a well-documented shortage of hearing healthcare professionals in South Africa (Donohue & Bornman, 2018; Mothemela et al., 2024; Pascoe & Norman, 2011; Swanepoel, 2006), and in April of 2023, the (HPCSA, 2023) reported that there was a total of 971 audiologists and 1 616 dually registered speech- language therapists and audiologists actively registered in practice. This supports audiologists' need to adapt and perform their roles in multiple contexts. The precise extent to which audiologists actively provide EA services within the educational landscape remains a question of critical significance. Limited evidence exists on what other challenges South African audiologists face in providing services in the educational environment. The situation is further complicated by South Africa's upper-middle-

income status (Jobarteh, 2024), where poverty and low socio-economic status are prevalent (Khoza-Shangase, 2020; Pillay et al., 2020) and teaching resources are limited (Narsai et al., 2021; Pillay et al., 2020).

Meeting the educational needs of school-aged learners with hearing loss in the South African context of inclusive education is challenging, as teachers already bear significant responsibilities in educating typically hearing learners in the mainstream environment (Joubert et al., 2017; Timmer et al., 2023). Teachers in mainstream- and specialised educational settings are also confronted by with additional issues, such as overcrowded classrooms and disciplinary concerns (du Plessis & Letshwene, 2020). Storbeck (Storbeck & Martin, 2010) suggests that the Department of Basic Education in South Africa lacks sufficient oversight in appointing teachers for schools catering to students with hearing loss. Consequently, some appointed teachers may have limited experience dealing with learners with hearing loss. To provide effective instruction to a school-aged learner with hearing loss, a teacher requires smaller class sizes, minimal background noise, non-reverberant surfaces and close proximity to the learner (Adebayo et al., 2020; HPCSA, 2023). The collaborative involvement of educational audiologists can elevate the standard of education for school-aged learners with hearing loss, potentially resulting in academic excellence (Johnson & Seaton, 2021; Naicker, 2018). In contrast, if educational audiologists are not part of the team managing a learner with hearing loss, teachers might not have access to information on how to support the school-aged learner with hearing loss (du Plessis & Letshwene, 2020; Johnson & Seaton, 2021), and these learners will not reach their full academic potential. In South Africa, there are very few posts available for audiologists in any type of school, which leads to a dearth of information regarding the service delivery of EA. Audiologists are also a vital part of the team when choosing a mode of communication for a learner with hearing loss (Johnson & Seaton, 2021) and supporting the teacher to ensure that the learner with hearing loss has optimal access to instruction in the mainstream or specialised educational environment.

In light of these considerations, it becomes imperative to determine the perceptions and practices of audiologists in the realm of EA service provision in South Africa. There is a shortage of comprehensive information on the integration of routine audiology services within the educational system, which in turn leads to a lack of service delivery to school-aged learners with hearing loss in their educational environment. If left untreated and unsupported, childhood hearing loss can lead to delayed language and cognitive development (Department of Basic Education, 2010; South African Council for Educators (SACE), 2020; Yousuf Hussein et al., 2018), contributing to learning and/or behavioural problems (Jalali et al., 2020). Furthermore, school-aged learners with hearing loss are at risk for having poor social skills

(World Health Organization (WHO), 2016), which in turn can impact the learner's academic success. Audiologists working in collaboration with teachers have the potential to enhance the educational outcomes as well as the cognitive development of school-aged learners with hearing loss (du Plessis & Letshwene, 2020; Johnson & Seaton, 2021). There is a need to understand how EA services contribute to the educational outcomes of school-aged learners with hearing loss. The scarcity of professionals in the field of audiology and the potential unmet needs of school-aged learners with hearing loss warrants a systematic exploration of the perceptions and practices of South African audiologists regarding EA service delivery. The aim of this study is thus to determine the perceptions and practices of Audiologists in South Africa regarding the service delivery of EA.

3.3 Materials and Methods

3.3.1 Design

A survey-based cross-sectional quantitative design was followed (Phase one), with a subsequent qualitative design where data was collected through a focus group discussion (Phase two). An online survey was distributed during Phase one, and an online focus group discussion was conducted during Phase two of this study. Ethical clearance for this study was obtained from the Research Ethics Committee of the Faculty of Humanities, University of Pretoria, South Africa (HUM039/0621).

3.3.2 Participants

Qualified, practising audiologists registered with the HPCSA were deemed eligible to participate in this study. Audiologists were recruited through the South African Speech-Language and Hearing Association (SASLHA), the South African Association of Audiologists (SAAA) the Audiology Private Practice Forum (APPF), social media (Facebook, LinkedIn, and WhatsApp) and word of mouth, using purposive sampling.

For Phase one, 104 audiologists consented to participate and completed the online survey. However, in order to ensure data reliability, audiologists who only completed the biographical section of the survey and those who took less than five minutes to complete the survey were removed from the study (Eysenbach, 2004). The final study sample for Phase one included 64 audiologists, working across all nine provinces of South Africa (Table 3.1). Audiologists' experience in practising as an audiologist ranged from less than one year to 35 years (mean = 7.5, SD = 8.70), and fifty-five audiologists (85.9%) reported seeing children as part of their daily caseload.

For Phase two of the study, seventeen audiologists who completed the survey indicated their willingness to participate in a focus group discussion. The researcher contacted these

audiologists via email and invited them to take part in an online focus group discussion (Nyumba et al., 2018). Six audiologists responded to the email, and eventually, only four participated in an online focus group discussion via Microsoft Teams. Three of these audiologists work in the Gauteng Province, and one works in the Western Cape Province in South Africa. All audiologists who participated in phase two have Bachelor's Degrees. Two work in a government hospital/ clinic, one in private practice and one in an educational setting.

Table 3.1*Audiologists' demographic characteristics (n = 64)*

Characteristic	n (%) per category
Province of work	
Gauteng	40 (62.5%)
KwaZulu-Natal	6 (9.4%)
Western Cape	6 (9.4%)
Eastern Cape	3 (4.7%)
Mpumalanga	3 (4.7%)
Northwest	3 (4.7%)
Free State	1 (1.6%)
Northern Cape	1 (1.6%)
Limpopo	1 (1.6%)
Highest qualifications	
Bachelor's degree	44 (68.8%)
Master's degree	16 (25.0%)
Doctoral degree	4 (6.3%)
Work-setting	
Government hospital/clinic	27 (42.2%)
Private practice	20 (31.3%)
Educational setting	7 (10.9%)
Academia	8 (12.5%)
Audiological representative for a company	1 (1.6%)
Corporate	1 (1.6%)
Years practicing as an audiologist	
Range	<1 year to 35 years
Average (standard deviation (SD))	7.5 years (8.70 SD)

3.3.3 Instruments

3.3.3.1 Survey

The survey, developed utilising established literature and protocols related to hearing screening for school-age learners and EA (Ash, 2021; du Plessis & Letshwene, 2020; HPCSA, 2019b; Johnson & Seaton, 2021), aimed to collect demographic data and determine audiologists' perceptions and practices in delivering EA services (Ash, 2021; du Plessis & Letshwene, 2020; HPCSA, 2019b; Johnson & Seaton, 2021). Comprising of two open-ended and eight closed-ended questions distributed across different sections, Section A primarily

focused on demographic details, while Section B delved into audiologists' perceptions and practices related to EA. Question 5 sought audiologists' perceptions on the roles and responsibilities of educational audiologists, whereas question 6 assessed the frequency of EA service provision and audiologists' perceived competency. Questions 7–9 were dedicated to identifying challenges encountered by audiologists in delivering EA services.

To ensure the content validity of the survey, a pilot study included three educational audiologists practising in different educational settings in South Africa (Brink et al., 2018). The pilot study participants received an informed consent letter detailing the study procedures. The survey was emailed to them, and they were asked to comment on aspects such as relevance, clarity, flow, length, question content and wording. The pilot study participants provided feedback, with one audiologist giving detailed input, another offering a single comment and one expressing overall satisfaction. The survey was adjusted based on their inputs to address all identified aspects. Before establishing the reliability and construct validity of the survey, an exploratory factor analysis (EFA) was conducted to uncover the underlying factor structure of the Likert-type items with response options 1 = “strongly disagree” to 5 = “strongly agree”. Two EFAs were conducted, one for the roles of educational audiologists and the other for their responsibilities. For each of these, several iterations were conducted, and items with low communalities (<0.4) (Eaton et al., 2019) and low factor loadings (<0.6) (Morrison et al., 2017) were removed. The EFAs revealed three factors for the roles of educational audiologists and three for the responsibilities of educational audiologists.

Cronbach's alpha coefficients were calculated to establish the reliability of the survey (Supplementary Appendix B, table 1). All factors for the roles, as well as for the responsibilities of the educational audiologist, exhibited values above 0.6, confirming internal consistency, as a Cronbach's value above 0.6 can be deemed reliable (Hajjar, 2018).

Spearman correlations were calculated to establish construct validity (Supplementary Appendix B, table 2 - 3). Construct validity consists of convergent validity (items belonging to the same construct should correlate highly) and discriminant validity (items not belonging to the same construct should have low correlations) (Heale & Twycross, 2015). For conciseness, not all correlations are presented. A brief discussion with some examples is however provided. For the roles of an educational audiologist, the correlations between items belonging to the same factor ranged from 0.368 to 0.572, and for the responsibilities of an educational audiologist, from 0.434 to 0.767, with all correlations being statistically significant ($p < 0.05$), thus establishing convergent validity. For discriminant validity, the correlations of items belonging to different factors are much weaker and not all are statistically significant, thereby establishing discriminant validity. One example is provided here. The correlation between V10:

“Role: to train teachers to support learners with hearing loss”, and V23: “Responsibility: Ensure learners’ hearing devices are operating optimally”, equals 0.130 with $p\text{-value} = 0.304 > 0.05$ (not statistically significant).

3.3.3.2 Focus group guide

The survey responses of the first phase and the literature informed the creation of a semi-structured focus group guide (Supplementary Appendix A). This guide, based on specific questions, ensured the discussions remained guided. Thematic data saturation was reached with one focus group discussion, as no new themes emerged towards the end (Brink et al., 2018; Eaton et al., 2019; Nyumba et al., 2018).

3.4 Data analysis

3.4.1 Data analysis: Phase one

The data obtained during Phase one of this study was captured using Qualtrics™ XM software and processed using the Checklist for Reporting Results of Internet E-Surveys, also known as the CHERRIES (Supplementary Appendix C) (Eysenbach, 2004). The collected data, automatically captured by the Qualtrics™ XM, was exported to the Statistical Package for Social Sciences (SPSS) version 28. Quantitative analysis involved descriptive statistics, such as frequencies, percentages, means (M), standard deviations (SD), medians (Mdn) and interquartile ranges (IQR). Inferential statistics, specifically nonparametric Spearman correlations (r_s), were employed due to the non-normal distribution of variables (Shapiro-Wilk $p\text{-values} < 0.05$). Correlation strength was interpreted as weak when the absolute value is less than 0.1, weak to moderate when the absolute value is between 0.1 and 0.3, moderate to strong when the absolute value is between 0.3 and 0.5, and strong when $r_s \geq 0.5$ (Téllez et al., 2015). The open-ended questions from the survey were analysed qualitatively through reflexive thematic analysis by the primary researcher and reviewed by the supervisor. In phase one 63 responses were captured and analysed thematically.

3.4.2 Data analysis: Phase two

In phase two of this study, the data was qualitatively analysed using reflexive thematic analysis. Reflexive thematic analysis is a qualitative method to interpret data logically, and compellingly, whilst not discounting the researcher’s subjectivity when identifying emerging themes and patterns (Hajjar, 2018; Heale & Twycross, 2015). A reflexive approach was chosen, as no themes were developed before data collection, and codes were developed throughout the coding phase (Braun et al., 2019). The primary researcher coded the qualitative data obtained from the focus group discussion and identified themes and sub-

themes. The supervisor gave insights and reviewed the initial codes as well as the themes that emerged.

3.5 Results

3.5.1 Phase one: Online survey

For both Phases one and two of this study, the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist was used to determine which information should be reported on (Supplementary Appendix D). During Phase one, the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) was utilised (Supplementary Appendix C).

3.5.1.1 Perceived roles and responsibilities of the educational audiologist

The factors identified in the EFA as the roles and responsibilities of the educational audiologist can be seen in Table 3.2.

Table 3.2

Factors identified as the roles and responsibilities of the educational audiologist.

	Roles of the educational audiologist			Responsibilities of the educational audiologist		
	<i>Instructional team member</i>	<i>Service Coordinator</i>	<i>Consultant</i>	<i>Habilitation of learners with hearing loss</i>	<i>Ensuring optimal function of learners' hearing devices</i>	<i>Identification of learners with hearing loss</i>
Factors identified						
Mean (SD)	4.69 (0.59)	4.27 (0.88)	4.78 (0.36)	4.12 (0.63)	4.56 (0.61)	4.20 (0.66)
Median (IQR)	5.00 (0.58)	4.50 (1.00)	5.00 (0.50)	4.00 (1.00)	5.00 (1.00)	4.25 (1.00)

Since the Likert scale ranged from 1 = “strongly disagree” to 5 = “strongly agree”, M and Mdn values above the midpoint of 3 factor indicate that the audiologists agreed with the statements of a factor, and a value below 3 indicates they were in disagreement. None of the M and Mdn values for any of the factors related to both roles and responsibilities were below 3, indicating that the audiologists were in overall agreement with the statements.

3.5.1.2 Service delivery and self-reported competency

Audiologists were questioned about including school-aged learners (Grade R – Grade 12) in their caseloads (question 3). The majority (85.9%) affirmed that these learners are indeed part of their current caseloads. Conversely, nine audiologists (14.1%) reported that school-aged

learners (Grade R – Grade 12) do not comprise a part of their caseloads. Furthermore, audiologists were asked about their experience in delivering various services to school-aged learners. Key findings include most (60.7%) reported never having conducted a classroom evaluation of the noise level. More than half (50.8%) reported seldom providing hearing aids for school-aged learners. The frequency of their reported services is indicated in Table 3.3.

Table 3.3:*Frequency of service delivery to school-aged learners (n=61)*

Service provided	How often services are provided				
	Never	Once	Seldom (< once a month)	Often (at least once a week)	Most of the time (> twice a week)
Observation in the classroom of school-aged learners	17 (27.9%)	12 (18.5%)	22 (36.1%)	9 (14.8%)	1 (1.6%)
Providing classroom recommendations to teachers, e.g., carpets, curtains, etc.	17 (27.9%)	9 (14.8%)	25 (41%)	9 (14.8%)	1 (1.6%)
Administering a school-based hearing screening program	18 (29.5%)	12 (18.5%)	22 (36.1%)	7 (11.5%)	2 (3.3%)
Collaboration with other health professionals (e.g., speech-language therapists)	2 (3.3%)	4 (6.6%)	10 (16.4%)	18 (29.5%)	27 (44.3%)
Providing hearing aids for school-aged learners	6 (9.8%)	5 (8.2%)	31 (50.8%)	13 (21.3%)	6 (9.8%)
Providing assistive listening devices for school-aged learners	18 (29.5%)	7 (11.5%)	22 (36.1%)	6 (9.8%)	8 (13.1%)
Evaluation of classroom acoustics (e.g., with a sound level meter)	37 (60.7%)	9 (14.8%)	9 (14.8%)	4 (6.6%)	2 (3.3%)
Collaboration with parents in managing the learner with hearing loss.	5 (8.2%)	8 (13.1%)	22 (36.1%)	15 (24.6%)	11 (18%)
Teacher training	15 (24.6%)	13 (21.3%)	22 (36.1%)	8 (13.1%)	3 (4.9%)
Hearing loss prevention	22 (36.1%)	16 (26.2%)	16 (26.2%)	4 (6.6%)	3 (4.9%)

Audiologists were also asked to rate their perceived competency in delivering specific EA services to school-aged learners. The responses are indicated in Table 3.4.

Table 3.4*Self-reported competency of EA service delivery*

	Not competent at all	Not very competent	Somewhat competent	Very competent	Extremely competent
Observation in the classroom of school-aged learners (n=60)	5 (8.3%)	7 (11.7%)	25 (41.7%)	19 (31.7%)	4 (6.7%)
Providing classroom recommendations to teachers, e.g., carpets, curtains, etc. (n=61)	4 (6.6%)	5 (8.2%)	22 (36.1%)	23 (35.4%)	7 (11.5%)
Administering a school-based hearing screening program (n=60)	3 (5%)	4 (6.7%)	10 (16.7%)	24 (40%)	19 (31.7%)
Collaboration with other health professionals (e.g., speech-language therapists) (n=61)	0 (0%)	0 (0%)	7 (11.5%)	23 (37.7%)	31 (50.8%)
Providing hearing aids for school-aged learners (n=61)	1 (1.6%)	5 (8.2%)	13 (21.3%)	20 (32.8%)	22 (36.1%)
Providing assistive listening devices for school-aged learners (n=61)	3 (4.9%)	11 (18%)	18 (29.5%)	16 (26.2%)	13 (21.3%)
Evaluation of classroom acoustics (e.g., with a sound level meter) (n=60)	6 (10%)	26 (43.3%)	17 (28.3%)	7 (11.7%)	4 (6.7%)
Collaboration with parents in managing the learner with hearing loss. (n=61)	0 (0%)	2 (3.3%)	15 (24.6%)	27 (44.3%)	17 (27.9%)
Teacher training (n=61)	2 (3.3%)	6 (9.8%)	15 (24.6%)	24 (39.3%)	14 (23%)
Hearing loss prevention (n=61)	1 (1.6%)	8 (13.1%)	27 (44.3%)	16 (26.2%)	9 (14.8%)

Approximately half (50,8%) of audiologists felt extremely competent in collaborating with other health professionals and 26 (43.3%) indicated that they are not very competent in the evaluation of classroom acoustics. This was in agreement with the frequency of the related service delivery reported, as almost half of the audiologists (44.3%) reported collaborating with other healthcare professionals more than twice a week, whereas almost two-thirds (60.7%) reported never having evaluated classroom acoustics. Interestingly, 27 (44.3%) audiologists felt only somewhat competent in hearing loss prevention.

Spearman's correlations were computed between audiologists' self-reported competency and the frequency of services delivered to school-aged learners. All correlations were statistically significant, including observation of school-aged learners in the ($r_s = 0.621$, $p < 0.001$), providing classroom recommendations to teachers ($r_s = 0.442$, $p < 0.001$), administering a school-based hearing screening program ($r_s = 0.428$, $p = 0.001$), collaboration with other health professionals ($r_s = 0.525$, $p < 0.001$), providing hearing aids for school-aged learners ($r_s = 0.448$, $p < 0.001$), providing assistive listening devices for school-aged learners ($r_s = 0.626$, $p < 0.001$), evaluation of classroom acoustics ($r_s = 0.559$, $p < 0.001$), collaboration with parents in managing the learner with hearing loss ($r_s = 0.551$, $p < 0.001$), teacher training ($r_s = 0.572$, $p < 0.001$) and hearing loss prevention ($r_s = 0.465$, $p < 0.001$). The obtained results suggest a correlation between the frequency of service delivery and self-reported competency, indicating that heightened service frequency corresponds to an augmented perception of competence among audiologists in delivering these services. This observation suggests that there is a broad trend wherein the frequency of service provision positively correlates with individuals' self-reported competency across various enumerated services. In essence, the more frequently services are rendered, the higher individuals tend to rate their proficiency in executing those services, encompassing a wide spectrum of service offerings.

The Mann-Whitney (MW) test was utilised to determine whether a significant difference was present between the responses of audiologists working in private practice ($n=20$) and audiologists working in government hospitals/clinics ($n=27$) in terms of the perceived roles and responsibilities. The z-values and p-values are reported in Supplementary Appendix B, Table 5 and Table 6. A significant difference was obtained between the audiologists working in private practice and those employed in government hospitals/clinics regarding their level of agreement concerning the responsibility of educational audiologists administering a school-based hearing screening program ($Z = -2.214$, $p = 0.028$). The mean and median of audiologists in government hospitals/clinics ($M = 4.33$, $Mdn = 4.50$) were significantly higher than that of the private practice audiologists ($M = 3.91$, $Mdn = 3.88$).

Government hospital/clinic audiologists, on average, therefore, exhibit a stronger agreement that administering a school-based hearing screening program is within the purview of educational audiologists. Furthermore, a significant difference was also obtained between audiologists working in private practice and those working in government hospitals/clinics in terms of their level of agreement relating to the "How often do you administer a school-based hearing screening program" question which forms part of the "Identification of learners with hearing loss" responsibility of the educational audiologist ($Z = 2.679$, $p = 0.006$). The mean and the median of the audiologists working in private practice ($M = 2.67$, $Mdn = 3.00$) are

significantly higher than those of the audiologists working in government hospitals/clinics ($M = 1.88$, $Mdn = 1.50$), indicating that audiologists working in private practice administer a school-based hearing screening program more often than government hospital/clinic employees. Interesting to note that audiologists providing regular hearing screening services at schools, did not show a stronger agreement that administering a school-based hearing screening is within the scope of influence of educational audiologists.

3.5.1.3 Reported EA service delivery challenges

Audiologists delivering services to school-aged learners were prompted to identify potential challenges they encounter, as illustrated in Table 3.5. Audiologists were afforded the option to acknowledge multiple challenges. It is noteworthy that audiologists had the flexibility to recognise several challenges, underscoring the diverse array of issues within this domain. The most commonly reported challenge was language differences, with a frequency of 36 occurrences (65.5%).

Table 3.5

Challenges reported by audiologists who provide services to school-aged learners (n=55)

Reported challenges	n (%)
Language differences	36 (65.5%)
Cultural differences	25 (45.5%)
Lack of cooperation from parents/learners	25 (45.5%)
Lack of cooperation of teachers	23 (41.8%)
Lack of access to schools	18 (32.7%)
Feeling unequipped	15 (27.3%)
Lack of adequate compensation	11 (20.0%)
Other challenges like a lack of resources, a lack of cooperation from the Department of Health and financial barriers for patients.	8 (14.5%)
No challenges	2 (3.6%)

3.5.1.4 Reported reasons for not providing EA services

Audiologists who do not include school-aged learners (Grade R - Grade 12) in their caseload (n=9) were given the opportunity to articulate reasons for not providing these services, with the option to select multiple reasons. Among these audiologists, explanations included the perception that EA falls outside their scope of practice or the contextual parameters of their current work setting (n=4; 44.4%), insufficient training in EA (n=1; 11.1%), challenges in accessing schools (n=1; 11.1%) and a lack of expertise in the domain (n=1; 11.1%). Other reported reasons comprised not currently being employed in a position that requires spending

time with patients (n=1; 11.1%) and a lack of awareness regarding available positions (n=1; 11.1%).

3.5.1.5 Additional training opportunities and undergraduate training

Audiologists (n=64) were queried about the extent to which their undergraduate training prepared them to deliver audiological services in school settings. Almost half of audiologists (n=29; 45.31%) felt somewhat equipped, while nearly one-fifth (n=12; 18.5%) conveyed a sense of being equipped to a significant extent. A minimal proportion of 1.56% (n=1) indicated not feeling equipped at all. Audiologists were also asked about their perspective on the potential enhancement of EA service delivery in South Africa through the inclusion of community service posts in government schools, as opposed to solely in hospital/clinical settings. A substantial majority, comprising almost two-thirds of the audiologists (n=41; 64.06%), expressed the belief that such an initiative would greatly improve EA service delivery. Additionally, just one quarter of audiologists (n=15; 23.44%) indicated that this shift would result in a somewhat improved delivery of EA services.

3.5.2 Phase two: Thematic analysis

The subsequent section (Table 3.6) elucidates the various themes and subthemes discerned through the thematic analysis of both the open-ended questions in the survey and the focus group discussion. Audiologists were specifically prompted to articulate their definitions of EA and aural rehabilitation in the survey. During the focus group discussion, audiologists had the opportunity to elaborate on their definition of EA and underscore perceived challenges in the service delivery of EA in South Africa. Audiologists also expressed their opinions on the necessity of educational audiologists in South Africa and provided suggestions to enhance the service delivery of EA in South Africa. Three main themes emerged as the data was being coded and re-coded. The first theme centred around different definitions of EA. The second theme included challenged to EA experienced in South Africa. The third theme had suggestions on improving the service delivery of EA in South Africa.

Table 3.6*Results of thematic analysis*

Theme & Subtheme	Description	Quote
THEME 1: Definition of EA		
Collaborative team-based service delivery in EA to maximise child's success.	The roles and responsibilities of the educational audiologist, with a focus on providing services to school-age learners	<p><i>"Services delivered by audiologists to children with hearing impairments within the educational setting." (S P41)</i></p> <p><i>"Hearing screenings, hearing tests, hearing aid fittings, therapy and aural rehab provided to children of school age either in a private or public work setting or at school." (S P1)</i></p> <p><i>"...It may also include the advisory and training role of acoustic environments, FM technology and staff and teachers involved with children with hearing loss." (S P17)</i></p> <p><i>"...I feel like the main thing is an educational audiologist is an advocate for the child, for the patient..." (F P3)</i></p>
	Providing audiological services in a specialised school or educational settings, specifically for school-aged learners with hearing loss.	<p><i>"...an audiologist based in a school setting or an Education Centre." (F P1)</i></p> <p><i>"An offer of audiology services to schools that cater for children with a hearing loss." (S P5)</i></p> <p><i>"Educational audiology is a broad term which probably covers the management and ongoing audiological care of learners based in a special school environment..." (S P17)</i></p> <p><i>"Provision of audiological services in the school/educational environment." (S P30)</i></p>
	Parents and teachers play pivotal roles as key team members in managing a learner with hearing loss.	<p><i>"Making sure that the team being the parents, the educators, and any therapists that might be in the educational setting of the child are aware of the child's auditory needs and that the child is accounted for in the educational setting." (F P1)</i></p> <p><i>"...collaborations with the educational team and with the parents of the children that are served." (S P26)</i></p>

		<i>"...put the ball in the parents' court and tell them this is now also your responsibility as it is my responsibility..." (F P2)</i>
	Improved access to sound for better educational outcomes.	<i>"An audiologist in a school setting that aims to improve the child with a HL's access to sound to be able to learn in the classroom". (S P 56)</i> <i>"...ensure that children with hearing loss are accommodated in their classroom in a way that maximises their learning opportunities so that they can meet their full potential." (S P 63)</i>
THEME 2: Perceived challenges to EA service delivery		
Parents are economically strained and unengaged.	Parents do not attend therapy sessions, and learners do not wear their hearing devices at home. Parents might not have the financial means to attend all sessions or even buy the appropriate hearing devices for their children.	<i>"...one of the biggest issues that we struggle with is parent understanding, education and commitment to the process..." (F P1)</i> <i>"...if the parents don't believe in the process or don't understand why it's important, then your device use is usually very often poor..." (F P1)</i> <i>"...There could be a financial burden work commitment. That transport issues now they must commit to bringing you know, their child then once a week..." (F P1)</i> <i>"...my first thing would say that its finances. With a child, not everyone has access to the finances that are available..." (F P2)</i>
Limited resources in schools.	Schools have limited access to resources. This includes access to equipment for audiological testing.	<i>"I think also the main part, if we look at our schools for the deaf is also resources. Most of them are based in the public sector and resources are very, very limited because they only have a short budget to work from and they usually don't get the most needed equipment that..." (F P2)</i> <i>"Especially in a public health setting, where resources are not readily available." (S P22)</i>

Financial challenges faced in private practice settings	In private practice, it is not viable to generate enough money if the focus is only on learners.	<i>"...It's hard in private practice. Why would you go and do further training? I mean it's very well known that Paediatrics is a drain on a private practice. They do not make you money. They take a lot of time and a lot of energy..." (F P1)</i>
Challenges within the educational environment.	Due to large class sizes and limited understanding of certain disabilities such as hearing loss, teachers may exhibit reluctance in seeking assistance.	<i>"...know from the teacher side, I think from their side if they have 40 children in the class, I'm not sure if they are very open to actually receive the [support]" (F P4)</i> <i>"...I feel like teachers that aren't equipped with the knowledge about certain disabilities like hearing, they don't really take into consideration what the child's needs are because of the amount or how big their classes are that they can't give that individual attention and that's how the child falls through the cracks..." (F P3)</i>
THEME 3: Improving EA service delivery		
Need for a better definition of EA and a better understanding of the expected responsibilities of educational audiologists.	The ambiguity surrounding the role and responsibilities of educational audiologists may contribute to uncertainty and a perceived deficit of information regarding the necessary qualifications and responsibilities within this field.	<i>"...I think that's where the confusion comes in. What exactly is educational audiology? Nobody really knows... I think just better defining what educational audiologists will be responsible in doing because there's a lot of question mark [about] what you need in order to be doing educational audiology..." (F P2)</i>

*S = Survey; P = Participant number; F = Focus group

When asked to define EA service delivery, most definitions centred around EA being a collaborative team-based service delivery in order to maximise children with hearing loss' success in the educational environment. Participants explained various roles and responsibilities of the educational audiologist while keeping in mind that the services should

be delivered in a specialised educational setting. Parents and teachers were also emphasized as important role players within this team-based approach to service delivery.

When it comes to the challenges experienced by audiologists in providing EA services in South Africa, many barriers were mentioned. Audiologists are aware that in South-Africa's diverse context in terms of language, culture and socio-economic status, parents of school-aged children with hearing loss do not always have the financial means to sustain ongoing therapy sessions. This means that the parents are unable to buy-in to the services needed and the children cannot reach their full potential. Teachers are also reluctant to seek help, because of the way that classrooms in South Africa are overcrowded. Audiologists also perceived a limitation in audiological resources at schools to provide the necessary EA services. In South-Africa, the perception of audiologists working in private practice is that paediatric audiology (which includes EA) is not financially rewarding, as it does not generate enough income to sustain a practice.

Audiologists felt that there is a need for more information and training on EA and that such information and training would lead to an increased service delivery in EA as well as an increased sense of competency when providing EA services.

3.6 Discussion

The aim of this study was to investigate audiologists' perceptions and practices regarding EA service delivery in South Africa and to determine the challenges they face in EA service delivery.

3.6.1 Roles and responsibilities of the educational audiologist

The roles and responsibilities of the audiologist in EA service delivery encompass not only the fitting of hearing devices, but also assessing the educational impact of hearing loss (Johnson & Seaton, 2021). According to recent literature (Johnson & Seaton, 2021; Wischmann et al., 2022), serving as service coordinators, contributing as instructional team members, and acting as consultants all form part of the roles of the educational audiologist. The responsibilities of educational audiologists pertain primarily to the clinical aspects of audiology, such as identifying hearing loss, assessing hearing status, providing habilitation, offering hearing loss prevention strategies, counselling and coaching relevant stakeholders and providing appropriate amplification for school-aged learners with hearing loss (Johnson & Seaton, 2021). These roles and responsibilities of the educational audiologist aim to effectively address the challenges posed by hearing loss within an educational context, striving for optimal outcomes in school-aged learners with hearing loss (Johnson & Seaton, 2021; Stach & Ramachandran, 2017; Webster, 2019).

This study revealed diverse perceptions among audiologists regarding the role and responsibility of the educational audiologist in South Africa, leading to varying opinions on the definition of EA. Audiologists participating in the survey predominantly centred their definitions around the providers of EA, the setting in which it is delivered, the services encompassed, the recipients of the services and the benefits of EA service provision. The commonly embraced definition of EA among participating audiologists highlights the delivery of audiological services within an educational environment rather than a clinical one (Johnson & Seaton, 2021; Naicker, 2018; Pottas, 2015). Overall perceptions indicated that EA is a service that should be provided to school-aged learners with hearing loss in the educational environment, which aligns with the definition of EA according to the literature (Johnson & Seaton, 2021; Pottas, 2015). However, there was a difference in how participating audiologists characterised the educational settings. While some advocated for confining EA services to schools tailored for learners with special needs, others advocated for its implementation in any educational setting. Following deliberations in focus group discussions, audiologists collectively agreed that EA should primarily be dispensed within specialised school environments, while auxiliary support could be extended to learners with hearing loss who are in mainstream educational settings. This assertion is consistent with existing literature, as corroborated by Johnson and

Seaton (2021) as well as Rashid et al., (2022), who recognise EA as comprising audiological services offered in specialised schools for learners who are Deaf or Hard of Hearing. Some audiologists posited that such services could be administered in diverse settings beyond educational contexts, contrary to the literature's delineation of EA as a service exclusively within educational settings for learners with hearing loss (Johnson & Seaton, 2021; Pottas, 2005; Stach & Ramachandran, 2017; Webster, 2019).

Overall, in agreement with Johnson and Seaton's (Johnson & Seaton, 2021) delineation regarding the roles and responsibilities of the educational audiologist, the study results suggest a consensus among participating audiologists regarding the roles of the educational audiologist being team members, service coordinators and consultants. Almost all participating audiologists agreed that counselling is essential, which agrees with what Johnson and Seaton (Johnson & Seaton, 2021) asserts, that counselling and coaching of parents, teachers and learners with hearing loss are pivotal responsibilities of educational audiologists. Although there was agreement regarding the importance of counselling, participating audiologists had varying opinions regarding the importance of in-person counselling/education of parents, teachers and learners regarding hearing loss, and they were of the opinion that virtual sessions with parents/teachers are adequate for counselling/educating purposes. Bhamjee et al. (2019) found that parents of children between the ages of 2 and 17 years, with cochlear implants felt that parent guidance was one of the most important support services that they have received. During the focus group discussion, all audiologists agreed that a telephone call or an online meeting (virtual consultation) would suffice to follow up on the learner's care and to ensure the school-aged learner with hearing loss is receiving optimal benefit from their hearing devices. Over the past three years, virtual consultations and tele-practice within the healthcare sector, have witnessed a surge in popularity, mainly spurred by the COVID-19 pandemic (Rabe, 2022). Notably, within the domain of audiology, tele-audiology has emerged as a prominent trend, owing to its cost-effective nature and its ability to extend hearing and hearing care services to underserved communities (Bhamjee, le Roux, Swanepoel, et al., 2022; Swanepoel, 2020). This tele-practice approach also holds promise for the field of EA, offering opportunities to optimise outcomes for school-aged learners with hearing loss.

Bhamjee, et al. (2022) found that, audiologists in South Africa perceive a deficiency in available resources and services within the hearing healthcare sector. This perception was reinforced by the audiologists in the current study, as some opted to characterise EA as a service that is less accessible or prevalent in South Africa. This characterisation reflects the belief that inadequate resources or -support structures hinder the effective delivery of EA

services in the South African context. Significant disparities were observed between participating audiologists working in private practice and those who work in government hospitals/clinics concerning their level of agreement regarding the responsibility for conducting a school-based hearing screening program and the frequency of its administration. In contrast to responses from audiologists employed in private practice, government-employed individuals expressed a significantly heightened belief that administering a school-based hearing screening program should fall within the scope of EA and not audiology in the clinical sense. This might be due to audiologists working in government not having the capacity to take on the additional responsibility of school-based hearing screening, as it has been reported that there is a shortage of audiologists in South Africa (Donohue & Bornman, 2018; Pascoe & Norman, 2011; Pillay et al., 2020; Swanepoel, 2006) as well as a lack of resources within the public health sector within the field of audiology (Bhamjee, le Roux, Schlemmer, et al., 2022; Breytenbach et al., 2015; Swanepoel, 2006; Yousuf Hussein et al., 2018). Privately employed audiologists administer a school-based hearing screening program more often when compared to audiologists working in government hospitals/clinics. This difference in frequency of service delivery may be attributed to the uneven distribution of audiological services in South Africa (Pillay et al., 2020; Swanepoel, 2006). Most audiological services are offered in the private sector (Pascoe & Norman, 2011), while the majority of the need for these services is within the public health sector (Donohue & Bornman, 2018; Swanepoel, 2006). Consequently, audiologists in private practice might be more frequently engaged by schools to conduct these screenings, as various private audiology practices have the capacity to engage in school screenings.

Another aspect that participating audiologists in this study highlighted, was the vital role of teamwork between the parents, teachers and therapist(s) when managing a learner with hearing loss. This aligns with previous research (Johnson & Seaton, 2021; Naicker, 2018; Pottas, 2015; Stach & Ramachandran, 2017; Storbeck & Martin, 2010), which demonstrates that school-aged learners with hearing loss requires a multidisciplinary team to realise their full potential.

3.6.2 Service delivery and self-reported competency

This study revealed that most audiologists believed that regular engagement in EA services was necessary to enhance their competence in providing such services. Notably, audiologists expressed a high level of competence when collaborating with other healthcare professionals, with 74% reporting frequent collaboration at least once a week. This underscores the common practice among audiologists in South Africa to collaborate with other healthcare professionals for optimal patient care (Hlongwa & Rispel, 2021).

Just more than half (53.3%) of audiologists rated their competence level below “somewhat competent” in evaluating classroom acoustics. This could be attributed to the fact that approximately two-thirds (60.7%) of audiologists indicated that they have never assessed classroom acoustics, even though they agreed that one of the roles of educational audiologists is to act as consultants and perform services such as evaluating classroom acoustics. This level of competence could also suggest a lack of training in the assessment of classroom acoustics in undergraduate programs and could indicate a need for further training. It underscores the perception that increased exposure and frequency of service delivery contribute to heightened confidence and competence in service provision, where Abdullah Al Gharibi and Arulappan (Abdullah Al Gharibi & Arulappan, 2020), demonstrated that, with increased exposure to services, self-reported competency increases. The International Classification of Diseases, 10th revision (ICD-10) is a standardised system for categorising medical diagnoses and procedures globally (Sheldon & Holman, 2023), but does not currently provide a code for the evaluation of classroom acoustics (World Health Organization (WHO), 2019). This absence poses challenges for audiologists in private practice, as it affects their ability to claim reimbursement from medical aids (as medical aids require an ICD-10 code to reimburse for a service rendered) and necessitates direct reimbursement from schools. Increased opportunities for evaluating classroom acoustics may contribute to a perception of increased competence among audiologists in providing such assessments.

3.6.3 Reported challenges in the service delivery of EA

In terms of the practices of audiologists, most of the participating audiologists (86%) reported seeing school-aged learners as part of their caseload. The biggest challenges participating audiologists experienced in terms of EA service delivery, included language barriers and cultural differences. This finding aligns with numerous studies in literature, which is that a notable language- and cultural barrier exists between audiologists and their patients in South Africa (HPCSA, 2019b; Rashid et al., 2022; Swanepoel, 2006; Swanepoel et al., 2014; Yousuf Hussein et al., 2018). It is important to note that there was no significant difference between the challenges faced by audiologists employed in government compared to audiologists working in a private practice setting. The literature does not distinguish between the challenges that are faced by audiologists in the public versus the private sector. However, research has clearly demonstrated a significant shortage of audiologists (Pillay et al., 2020; Swanepoel, 2006; Yousuf Hussein et al., 2018) and resources within the hearing healthcare sector (Bhamjee, le Roux, Schlemmer, et al., 2022), regardless of the context in which these services are provided.

Furthermore, audiologists also experienced a lack of cooperation/compliance from the parents/teachers or the learners themselves when it comes to EA services. The non-compliance with treatment among adult clients or parents of children with hearing loss, - such as neglecting to wear hearing devices or skipping therapy sessions, as pointed out by. (Coleman et al., 2018), could stem from audiologists not adequately addressing their emotional and behavioural needs. Additionally (Fouché-Copley et al., 2016) discovered that audiologists express concerns about parents' and teachers' lack of compliance with assessment and intervention programs specifically with regards to children with auditory processing disorders, potentially attributed to a lack of awareness on the part of the parents' and teachers.

3.6.4 Additional training opportunities and undergraduate training

In 1998 a compulsory community service year was established by the HPCSA as a regulatory requirement for various newly qualified healthcare professionals to work in a public setting (National Department of Health, 2009). This initiative aimed to provide these professionals with valuable experience in their respective fields and to address healthcare disparities, especially in underserved areas (Reid et al., 2018). Presently, there are no community service posts for audiologists wanting to specialise in EA in South Africa (Rutherford, 2017). To enhance EA service provision, most participating audiologists (64.1%) advocated for the inclusion of community service posts for audiologists in schools.

Nearly half (45.3%) of the participating audiologists perceived their undergraduate training as only somewhat equipping them for EA services. Given the absence of a mandate for additional postgraduate training for audiologists within educational settings by the Department of Health in South Africa (Department of Health, 2011; McNamara & Macione, 2011), audiologists highlighted a perceived information gap regarding EA and advocated for more training opportunities to foster confidence in service delivery. This information gap pertains to information received during undergraduate training as well as a lack of access to further information and training after graduation. Suggestions included developing additional training courses or continuing professional development (CPD) activities tailored for audiologists interested in educational environments. By recognising the role of CPD in updating professionals' knowledge and skills (HPCSA, 2021), this might be feasible in the South African context.

3.7 Study strengths and limitations

This study employed research triangulation to mitigate researcher bias, involving the primary researcher and both supervisors, along with data triangulation through surveys and a focus

group discussion (Brink et al., 2018). A notable strength was the diverse geographical representation of audiologists across South Africa, enhancing sample representativeness (de Villiers et al., 2021). However, study limitations include potential selection bias due to audiologists primarily working in government hospitals/clinics and private practice settings (Brink et al., 2018). Prior to data collection, a specific definition of EA was not provided, which might have influenced how participants responded to the study, thereby avoiding potential bias. Future research could explore the perceptions of teachers of learners with hearing loss on EA services and collaboration between audiologists, parents, and teachers.

3.8 Conclusion

Given the limited information available on the status of EA service delivery in South Africa, this study aimed to investigate audiologists' perceptions and practices regarding EA service delivery in South Africa. The objective is to deepen the understanding of EA within the South African context and offer valuable insights to inform future practices in the field.

Study results have implications for educational and policy development in terms of frequency and organisation of school screenings and future training of audiologists. Results indicate a need for a more precise definition of EA, with audiologists requiring more learning opportunities in order to provide EA services confidently. Additional training programs and workshops could be hosted by tertiary institutions or associations for audiologists wanting to practice within the field of EA. While many audiologists who participated in this study encounter learners with hearing loss, not all offer comprehensive EA services. This could be due to many factors reported such as lack of resources, lack of knowledge, no interest in the field or feeling unequipped to provide these services. EA service delivery could increase if resources are allocated from the Departments of Health and Basic Education to empower audiologists within an educational context. Teamwork is emphasised, with critical team members identified as parents, teachers, and, in some cases, speech-language therapists. Effective communication within the team, especially between audiologists and teachers/parents, is crucial to ensure optimal development of learners with hearing loss.

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CHAPTER FOUR: DISCUSSION AND CONCLUSION

4.1 Overview of research findings

This study aimed to describe the perceptions, practices and challenges of audiologists in South Africa with regard to EA, as limited information exists on the status of EA service delivery in South Africa. EA is a specialised field within the audiology profession, and before service provision can be enhanced, it is necessary to understand what services are currently being rendered by audiologists in South Africa and what challenges audiologists face in terms of EA service delivery. A further objective of this study was to enhance the understanding of EA in the South African context and provide insights to inform and guide future practices in this field.

The results obtained in this study have been analysed and integrated, leading to a comprehensive understanding of the perceptions, practices and challenges audiologists in South Africa face regarding EA. Once the perceptions, practices and challenges have been identified and understood, the service delivery of EA can expand in South Africa. Drawing from the findings of this study, several key conclusions have been reached, offering valuable insights to advance the field.

4.1.1 Perceived roles of the educational audiologist

In this study, the roles of the educational audiologist, as outlined in the literature, were referred to in both the survey responses and the focus group discussion. These roles pertain to the audiologist acting as an instructional team member, service coordinator and consultant within the educational setting (Johnson & Seaton, 2021). The integrated results indicated a consensus among participants regarding the perceived roles of the educational audiologist.

Participants perceived EA to be a service provided by an audiologist within a team when managing a school-aged learner with hearing loss. This correlates with the available literature on EA (Ash, 2021; Johnson & Seaton, 2021; Pottas, 2015). Participants perceived the role of the educational audiologist as an instructional team member as important, especially regarding the education of parents/teachers of school-aged children with hearing loss. Virtual sessions by the audiologist with parents/teachers were perceived as adequate for intervention purposes.

Participants agreed that the educational audiologist should also be the service coordinator for the school-aged learner with hearing loss. One participant indicated this role in their definition of EA: “... *monitoring HA functioning. Classroom management of learners with HL. Seating etc. Information sharing and training - teachers, including use of HA, FM Systems and Soundfield systems (S P54)*”. This aspect was not elaborated on during the focus group

discussion. Uncertainty existed about the extent of the role of the audiologist in terms of advocating on behalf of school-aged learners with hearing loss. While participants agreed that these learners need an advocate, there was debate over whether that role should be filled by the child's parent or the educational audiologist. Within the context of EA, it is imperative that audiologists fulfil their primary role as advocates, especially within the South African educational context where resources are limited. Advocating for school-aged learners with hearing loss is essential to ensuring they receive the necessary support services to reach their full potential, ultimately contributing to the advancement of an inclusive education system.

The role of the educational audiologist as a consultant involves providing information to parents and teachers of school-aged children with hearing loss. This was briefly mentioned by two participants in the survey: *"Information sharing and training - teachers, including use of HA [hearing aid], FM Systems and Soundfield systems"* (S P54) *"Providing screening, diagnosis and rehabilitation as well teacher and parent guidance"* (S P57). However, this topic was not elaborated upon during the focus group discussion. Interestingly, while 86.9% of participants reported feeling "somewhat competent" or more in providing teacher training, 18% indicated that they conduct such training more than once a month. This suggests that, despite having limited experience in delivering this service, participants feel confident in their ability to do so.

The importance of teamwork within the team managing the school-aged learner with hearing loss in the South African context was elaborated on. It was indicated that parents and teachers are the most prominent members of this team working together to ensure optimal outcomes for the school-aged learner with hearing loss. 73.8% of participants reported collaborating with other healthcare professionals at least once a week or more. During the focus group, one participant described teamwork as: *"Making sure that the team being the parents, the educators, and any therapists that might be in the educational setting of the child are aware of the child's auditory needs and that the child is accounted for in the educational setting."* (F P1). The service in which most participants reported having significant experience was collaboration with other healthcare professionals, with over two-thirds providing this service at least once a week or more. Participants' self-reported competency regarding collaboration with other healthcare professionals was the highest in comparison to other services provided in terms of the role of an educational audiologist.

Overall, the different roles of the educational audiologist were regarded as equally important. More participants emphasised the audiologist's role as an instructional team member and as a consultant to parents and teachers of school-aged learners with hearing loss, in comparison to the role of the educational audiologist as service coordinator. The literature supports this

view, highlighting that audiologists are an essential part of the team when managing school-aged learners with hearing loss (Ash, 2021; Johnson & Seaton, 2021; Kornak, 2019; Pottas, 2015). The specific roles an audiologist assumes and the extent to which these roles are performed depend on the needs of the child with hearing loss and the support available to them (Johnson & Seaton, 2021).

4.1.2 Perceived responsibilities of the educational audiologist

It was clear from the results of the survey that participants framed their definitions of EA primarily around the core responsibilities of educational audiologists. These responsibilities include the professionals who provide EA, the contexts in which it is delivered, the range of services offered, the individuals receiving these services and the benefits resulting from EA. The duties highlighted were predominantly clinical, encompassing the identification of hearing loss, assessment of hearing function, provision of (re)habilitation services, implementation of preventive strategies for hearing loss, counselling and coaching of relevant stakeholders and the fitting of appropriate amplification for school-aged learners with hearing loss (Johnson & Seaton, 2021). This focus on clinical responsibilities in the definitions of EA likely stems from participants' frequent engagement with these visible and tangible tasks, which are more easily observed and articulated compared to the less prominent roles of the educational audiologist. Consequently, these clinical duties were more frequently emphasised and discussed by participants.

Recently, research has focused on increasing access to school-based hearing screening in South Africa and training community healthcare workers in lieu of qualified healthcare professionals (Frisby et al., 2022; Mothemela et al., 2024; Swanepoel, 2020; Yousuf Hussein et al., 2018). Despite these advancements, there remains a limited understanding of the extent to which audiologists practicing in South Africa are involved in other aspects of EA beyond hearing screening. One participant in the survey mentioned hearing screening as well as hearing assessments when asked to define EA: *“Hearing screenings, hearing tests, hearing aid fittings, therapy and aural rehab provided to children of school age either in a private or public work setting or at school.”* (S P1). In phase one of this study, a significant difference was observed between participants working in a government hospital/clinic and participants in private practice with regards to their perceptions of hearing screening. Participants employed in government hospitals or clinics expressed a strong belief that hearing screening falls within the responsibilities of an educational audiologist. However, when it came to implementing school-based hearing screening programs, these participants reported conducting such programs less frequently compared to audiologists working in private practice.

Habilitation was mentioned by six participants in phase one, but it was not elaborated on during Phase two. Participant 52 in the survey stated: *“Audiologists who render part-time or full-time diagnostic testing, hearing aid related services and aural rehabilitation to pre-school and school going children of all ages.”* (S P52). With regards to counselling and coaching, participants agreed on the importance of this responsibility of the educational audiologist – but they differed in terms of the way counselling or coaching should be done. During the focus group discussion, participants felt that in-person sessions with parents/teachers as a follow-up of counselling sessions were not necessary, as we now have a multitude of online ways to communicate. A video or phone call was suggested for follow-up and communication with team members, which shows how important consistent communication is between relevant stakeholders. This ensures that communication takes place between the parents/teachers and the educational audiologists in a manner that is more convenient and less time-consuming.

4.1.3 Perceived challenges to EA in South Africa

South Africa is a resource-limited country (Bhamjee, le Roux, Schlemmer, et al., 2022; Narsai et al., 2021; Pillay et al., 2020) where healthcare service delivery and specifically audiology face a multitude of challenges, the most prevalent challenge including language/cultural barriers between the audiologist and the client (Bhamjee, le Roux, Schlemmer, et al., 2022; Mothemela et al., 2024; Pillay et al., 2020). In this study, during Phase one, it was indicated by participants that most encountered language- and cultural barriers when working with school-aged learners with hearing loss. Other specific challenges included a lack of cooperation from parents, learners and teachers, limited access to schools, feeling unequipped to provide EA services and inadequate compensation for providing EA services. Additional issues such as insufficient audiological and financial resources, lack of cooperation from the Department of Health in providing support for audiologists providing EA services and financial barriers for patients in terms of the cost of devices, device maintenance as well as the added cost of travelling for aural rehabilitation services were also mentioned. During the focus group discussion, participants provided more profound insights into challenges specific to EA. Participant two highlighted the challenges faced in terms of resources: *“...I think also main part, if we look at our schools for the deaf is also resources. Most of them are based in the public sector and resources are very, very limited because they only have a short budget to work from and they usually don't get the most needed equipment that they need. (F P2)”*. Participants reported experiencing challenges with parents of school-aged learners with hearing loss who were hesitant to engage in aural rehabilitation or ensure consistent hearing aid use. Contributing factors for this reluctance included work commitments, financial constraints, and a lack of awareness regarding the importance of consistent hearing aid use

at home. Participant one elucidated their perception further during the focus group discussion: *"...one of the biggest issues that we struggle with is parent understanding, education and commitment to the process..."* *"...if the parents don't believe in the process or don't understand why it's important, then your device use is usually very often poor..."* (F P1).

Other challenges that surfaced included limited resources in educational settings and difficulties teachers face when instructing classes that include a few school-aged learners with hearing loss. Two participants highlighted the perceived challenges faced by teachers: *"I also think the main part, if we look at our schools for the deaf is also resources. Most of them are based in the public sector and resources are very, very limited because they only have a short budget to work from and they usually don't get the most needed equipment that..."* (F P2) *"...know from the teacher side, I think from their side if they have 40 children in the class, I'm not sure if they are very open to actually receive the [support]."* (F P4).

Some challenges related to the lack of EA services in South Africa were also discussed. 85.9% of audiologists in this study reported providing audiological services to school-aged children, but some participants perceived that in the private sector, paediatric audiology (which includes EA) is not seen as a lucrative source of income. This could be a contributing factor in the limited EA service delivery in South Africa. A statement from participant one and participant two during the focus group describes this best: *"...It's hard in private practice. Why would you go and do further training? I mean it's very well known that Paediatrics are a drain on a private practice. They do not make you money. They take a lot of time and a lot of energy..."* (F P1) *"... it is only to a certain point because again when we look at private practice, they can't only make use of one sort of income..."* (F P2).

4.2 Critical evaluation: Study strengths and limitations

A critical evaluation of research is necessary to determine the study's merit and the applicability of its findings in clinical practice (Brink et al., 2018).

4.2.1 Study strengths

This study provides new insight into the field of EA service delivery within South Africa from a group of current, practicing audiologists. This study also gives information regarding audiologists' reported perceptions and practices in terms of EA as well as the perceived challenges that they face. These perceptions of audiologists influence the practices and the extent of audiological service delivery to school-aged children with hearing loss. There is very little information and published evidence available on the current state of EA service delivery in South Africa, and this study is one of the first recent reports on the topic of EA service delivery in South Africa. One aspect of EA service delivery that has been focussed on in recent

research is hearing screening of school-aged children and identification of hearing loss for school-aged learners (Ehlert, 2017; Jalali et al., 2020; Mahomed-Asmail et al., 2016b; Yousuf Hussein et al., 2018). It is necessary to understand audiologists' perceptions regarding EA service delivery, know what their practices are and identify the challenges that audiologists face when providing EA services to school-aged children with hearing loss. This study contributes towards identifying, understanding and addressing these different aspects in order to enhance the service delivery of EA in South Africa.

The use of triangulation in this research study enhanced the validity and reliability of the findings by combining multiple methods or data sources, reducing bias and cross-validating findings. Researcher triangulation, where the primary researcher and one supervisor were present during the focus group discussion ensured more accurate field notes as well as a more in-depth analysis of responses obtained (Brink et al., 2018). Data triangulation was also employed, where different means of data collection, namely quantitative and qualitative methods, were employed. This enhanced the study's validity and confirmability and provided greater depth and insight into the data (Morgan, 2019; Savela, 2018). This methodological triangulation further strengthened the study by enhancing its validity and mitigating any inherent biases (Brink et al., 2018).

The online nature of this study eliminated the cost associated with paper-based surveys (McPeake et al., 2013) and ensured a larger geographical spread of participants could be reached (Gray et al., 2020). Audiologists from all the provinces of South Africa could provide insight into EA and describe their perceptions, practices and challenges experienced within their context.

A definition of EA was not provided to participants at the beginning of this study. This enabled participants to provide a much broader definition which provided deeper insight into their perceptions regarding EA (Sutton & Austin, 2015). This approach also ensured that the researcher's inherent bias regarding EA was not conveyed to the participants.

4.2.2 Study limitations

Only six participants responded to the invitation to participate in the online focus group (phase two), and only four were available to attend. The small sample size may have reduced data diversity (Vasileiou et al., 2018), limited generalizability to the broader South African context and compromised validity (Faber & Fonseca, 2014), increasing the risk of biased conclusions (Dai et al., 2023). However, it may have encouraged greater engagement, as each participant had ample opportunity to express their views without feeling overshadowed by a larger group (Pietilä et al., 2020).

This study may be subject to selection bias, as the majority of participants were employed in government hospitals or clinics (42%) or in private practice (31%). This distribution does not accurately reflect the broader population of audiologists in South Africa, where approximately 80% work in the private sector and about 20% are employed in the public sector (Pillay et al., 2020). The effect of a study sample inaccurately representing the larger population, could lead to inaccurate conclusions being drawn (Chen et al., 2021).

A definition of EA was not provided at the outset of this study, which may have influenced participants' responses. Without a standardised definition, each participant might have had a different understanding of what EA entails and the associated roles and responsibilities of an educational audiologist. This variation in interpretation could have introduced bias, as participants likely defined EA based on their personal experiences and answered subsequent questions according to their own definitions.

4.3 Clinical implications

Audiologists play a critical role in the management team for school-aged learners with hearing loss (Johnson & Seaton, 2021; Pottas, 2015; Van Dijk, 2003). Understanding the perceptions, practices and challenges of audiologists regarding EA service delivery could enhance the service delivery to this population.

4.3.1 Development of structured guidelines for EA within South Africa

The findings of this study have significant implications for educational- and audiological policy/ guideline development by the HPCSA. Currently, there are limited structured guidelines regarding the provision of EA services in South Africa. Multiple policies and guidelines on hearing screening of school-aged learners exist (Department of Basic Education, 2020b; HPCSA, 2018, 2019b; Johnson & Seaton, 2021; Mothemela et al., 2024; Pillay et al., 2020; Pottas, 2015; South African Association of Audiologists (SAAA), 2014; South African Speech Language and Hearing Association (SASLHA), 2011), but a deficit exists regarding more focused guidelines for broader EA service delivery within the South-African educational context. More structured guidelines should include a clear definition of EA as well as the goals of EA, the services within the scope of an educational audiologist, and the recommended frequency of providing these services in South Africa. Van Dijk et al., (2003) proposed a service delivery model for EA within an inclusive education system. However, inclusive education has not yet been fully attained in South Africa (Donohue & Bornman, 2018), and audiologists need to provide services to school-aged learners with hearing loss within both the special education and mainstream education contexts. The concept of inclusive education was notably absent from participants' responses, highlighting the significant work still required to

ensure that schools become more inclusive, particularly for school-aged children with hearing loss. A revised service delivery model is essential to address the specific challenges faced by audiologists in both specialized and mainstream education within the South African context. This model should aim to meet the unique needs of school-aged learners with hearing loss, ensuring that support is effectively tailored to their local educational environment.

Currently, educational audiologists are employed only by schools for learners with disabilities, and no full-time positions are available for audiologists in mainstream schools (Rutherford, 2017) where there may also be school-aged learners with hearing loss. The participants in this study perceived the current approach to delivering EA services as generally adequate, and inclusive education was not mentioned during the focus group discussion. However, audiologists employed in private clinical practice are seen as needing to take greater responsibility in ensuring follow-up services for school-aged learners with hearing loss under their care. Educational audiologists must realize their primary role as advocates, especially in the current educational system where support services rendered by the system itself are not readily available. Audiologists can advocate for the school-aged learners with hearing loss by ensuring all members of the team are communicating and working together to achieve the optimal outcome for the learner. Audiologists furthermore advocate for these learners by ensuring that the parents and teachers understand the necessity of ongoing audiological monitoring of school-aged learners with hearing loss. It is crucial for audiologists in South Africa to recognise that their role extends beyond the initial fitting of hearing aids; it encompasses ongoing support within the educational setting to aid learners with hearing loss. Despite the challenges encountered in practice, the provision of EA services remains an essential component of comprehensive audiological care.

4.3.2 Addressing challenges faced by audiologists

Participants in this study expressed a need for more information and training to confidently deliver EA services to school-aged learners with hearing loss. This might be due to the fact that additional training is not required for audiologists to provide EA services in South Africa, as it is included in undergraduate training (Department of Health, 2011; McNamara & Macione, 2011). Tertiary institutions or professional associations could offer additional training programs and workshops for audiologists interested in EA and to enhance awareness of EA. These institutions or associations could also seek CPD (Continuing Professional Development) accreditation, allowing audiologists to earn CPD points and stay up to date on the developments in the field of EA. Aside from studying towards an additional degree in EA, such as is required in the United Kingdom (Ash, 2021; Rosenberg, 2016), a few short courses on

EA are offered in an online capacity on the AudiologyOnline website, as well as some webinars on the *Educational Audiology Association* website. Short courses are also offered by the Mary Hare University in the United Kingdom. The need for more comprehensive training in EA is not unique to South African audiologists, as similar deficiencies in the availability of training and additional courses in EA have been observed internationally (Johnson & Seaton, 2021).

While many participants in this study encounter school-aged learners with hearing loss, not all deliver comprehensive EA services. Contributing factors include limited resources, insufficient knowledge, lack of interest in EA, or a sense of being inadequately prepared to offer these services. Expanding training opportunities in the field of EA could enhance awareness of its importance and enable audiologists in private practice to provide more thorough and effective EA services to school-aged children with hearing loss.

4.3.3 Active involvement of audiologists in EA

Transdisciplinary teamwork is widely acknowledged as essential in both the healthcare- and education sectors (Department of Health, 2011; World Health Organization (WHO), 2010). Research has demonstrated that such collaborative approaches enhance client and patient outcomes (Department of Health, 2011; Mohamed et al., 2024). In this study, participants identified key members of the transdisciplinary team, such as audiologists, parents, teachers, and, in some cases, speech-language therapists. This aligns with findings by Johnson and Seaton. (2021) who highlight the integral role of educational audiologists within the educational team managing school-aged learners with hearing loss. The involvement of this team is crucial to ensuring positive outcomes for these learners. Effective communication among team members—especially between audiologists, teachers, and parents—is vital for supporting the optimal development of school-aged children with hearing loss (Mohamed et al., 2024; World Health Organization (WHO), 2010). However, some participants noted that, while teamwork is practiced in South Africa, audiologists do not always fully recognise the importance of the transdisciplinary team in managing these learners. During the focus group discussion, participants felt that in-person sessions with parents/teachers as a follow-up of counselling sessions were not necessary, as we now have a multitude of online ways to communicate. A video or phone call was suggested for follow-up and communication with team members. This ensures that communication takes place between the parents/teachers and the educational audiologists in a manner that is more convenient for all stakeholders and less time-consuming, as the added time and cost of travelling does not need to be considered. Audiologists need to adopt a more collaborative approach, engaging actively with teachers, parents or caregivers, and other therapists involved in the care and education of school-aged children with hearing loss.

4.4 Suggestions for future research

This study considered the perceptions, practices and challenges of audiologists regarding the service delivery of EA in South Africa. Future research could focus on exploring teachers' perceptions of EA service delivery and the challenges they face when educating learners with hearing loss. Teachers face an abundance of challenges in the educational environment (du Plessis & Letshwene, 2020; Joubert et al., 2017; Timmer et al., 2023) and these challenges could impact teachers' perceptions regarding the importance of EA. In this study, audiologists indicated an awareness of challenges faced by teachers and the need for a better understanding of those challenges in order to support teachers better. An exploration into teachers' perceptions regarding EA could thus be valuable. As highlighted by (Mohamed et al., 2024), there is limited evidence regarding the nature of transdisciplinary teamwork in South Africa. Exploring this aspect within the context of managing school-aged learners with hearing loss could provide valuable insights. Additionally, qualitative exploration of parents' perceptions regarding the EA services their school-aged learner with hearing loss received could provide a deeper understanding of their specific needs (Savela, 2018) and identify areas for improvement in the current EA service delivery system. Qualitative research has been shown to yield information-rich data (Savela, 2018) that includes participants' individual perceptions. Additionally, a qualitative study could provide a guide for the extent of support that parents of school-aged learners with hearing loss need. Furthermore, future studies could explore the training and education provided to teachers and school staff, such as administrators, in terms of the importance of EA and the teacher's collaborative role in managing a school-aged learner with hearing loss.

Given the deficiencies in the current education and training of educational audiologists internationally, as noted by (Johnson & Seaton, 2021), future research might benefit from comparing EA protocols and policies internationally. This comparative approach could help address gaps in EA service delivery in South Africa. Recognising the numerous challenges faced by audiology service delivery in South Africa (Bhamjee, le Roux, Schlemmer, et al., 2022; Mothemela et al., 2024; Swanepoel, 2006), it is crucial to address these challenges within the EA field to enhance service delivery. Future research should focus on overcoming the challenges identified in this study, thereby increasing access to EA services nationwide.

4.5 Conclusion

In South Africa, EA services are predominantly delivered in specialised education settings, with inclusive education yet to be fully realized. School-aged learners with hearing loss require continuous support from their audiologists, regardless of their educational environment. This

study highlights the urgent need for clear guidelines to improve the provision of EA services for these learners. It also sheds light on the challenges audiologists face in delivering such services, which must be addressed to enhance EA service delivery in South Africa. Given that audiologists in South Africa primarily work within private practice or public healthcare settings, it is crucial for them to fully comprehend their roles and responsibilities in providing EA services to school-aged learners with hearing loss. To strengthen this understanding, comprehensive training, ongoing professional development, and increased awareness of EA is essential. These efforts will empower audiologists to confidently deliver effective EA services. Moreover, audiologists must actively advocate for the needs of school-aged learners with hearing loss and take responsibility for their ongoing management. This advocacy is key to advancing inclusive education in South Africa, as supporting the needs of these learners is fundamental to fostering an inclusive educational environment.

In defining EA, it is essential to consider the services provided, the team involved and the goal of ensuring the optimal development and participation of school-aged learners with hearing loss. As defined in this study:

Educational audiology service delivery is the provision of comprehensive audiological services to children, especially to children (including their families) in educational contexts. It includes hearing screening and identification of hearing loss, diagnostic hearing assessments, provision of appropriate amplification and assistive listening devices, aural (re)habilitation, hearing loss prevention, counselling and coaching, e.g., classroom accommodations to improve the learning environment, supporting well-being, especially socio-emotional well-being and competence (including peer support), case management, developing IEPs, collaborations with the educational team and with the parents of the children that are served. (SP26)

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APPENDICES

Appendix A: Ethical clearance from the Research Ethics Committee

Appendix B: Informational letter to SAAA, SASLHA and APPF

Appendix C: Letters of consent SAAA, SASLHA and APPF

Appendix D: Informed consent letter to participants

Appendix E: Survey

Appendix F: Focus group guide and prompts

Appendix G: Data storage form

Appendix H: Checklist for Reporting Results of Internet E-Surveys (CHERRIES)

Appendix I: Image for social media

Appendix J: Cronbach's alpha coefficient

Appendix K: Spearman correlation

Appendix L: The consolidated Criteria for Reporting Qualitative Research (COREQ) checklist

Appendix M: Proof of submission to a journal

Appendix A: Ethical clearance from the Research Ethics Committee



Faculty of Humanities

Fakulteit Geesteswetenskappe
Lefapha la Bomotheo



10 November 2022

Dear Miss C Venter

Project Title: Educational audiology service delivery in South-Africa: Perceptions and practices of audiologists
Researcher: Miss C Venter
Supervisor(s): Prof L Pottas
Department: Speech Language Pathology and Audiology
Reference number: 18014382 (HUM039/0621)
Degree: Masters

I have pleasure in informing you that the above application was **approved** by the Research Ethics Committee on 10 November 2022. Please note that before research can commence all other approvals must have been received.

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,

A handwritten signature in black ink, appearing to read 'Karen Harris'.

Prof Karen Harris
Chair: Research Ethics Committee
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: tracey.andrew@up.ac.za

Appendix B: Informational letter to SAAA, SASLHA and APPF



Faculty of Humanities

Fakulteit Geesteswetenskappe
Lefapha la Bomothe

Department of Speech-Language Pathology and Audiology



Attention: South African Academy of Audiologists (SAAA)

October 2022

Re: Permission to distribute a survey to audiologists regarding their perceptions and practices of service delivery of educational audiology in South Africa

I am a postgraduate student at the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I am conducting research in fulfilment of a masters' degree in Audiology (MA Audiology). This study aims to describe the perceptions and practices of audiologists regarding the service delivery of educational audiology in South Africa. This study attempts to collect data from Audiologists practicing in South Africa.

I have developed an online survey for the purpose of this study and would like to request your assistance in distributing this online survey via your email and social media platforms.

Title: *Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*

Researcher: Corlien Venter

Study Leaders: Prof Lidia Pottas and Dr Talita le Roux

Research Design:

This study will have a mixed-method explanatory design, whereby phase one will comprise the completion of an online survey and phase two will comprise online focus groups.

Participants:

Practicing South African Audiologists registered with the HPCSA.

Procedures:

Participants will be expected to complete an online survey using the Qualtrics platform. Prospective participants will receive an email from your organisation containing the link to the online survey (thus, SAAA will distribute the link to the survey, not the researcher). For the sake of confidentiality, the researcher will not have access to the prospective participants' contact details. The first page of the webpage will contain the informed consent form. If participants wish to participate, a virtual "click to accept" button will indicate their consent to participate voluntarily in the study. Audiologists who meet this study's criteria and whom the researcher knows personally will also be contacted to request their participation in this study. Once they have granted permission the link to the survey will be sent to them. Only participants who have given consent will be granted access to the survey. The survey will take approximately 15 minutes to complete. In the final question of the survey, participants will be asked whether they would be willing to participate in an online focus group, as the second phase of this study. If participants are willing to participate in this second phase of the study, they will be requested to provide their email addresses. Only participants who indicate their willingness to participate in the online focus groups will be contacted by the researcher via email to confirm a date and time for these focus group discussions. Additionally, after the completion of the focus groups, each participant in each focus group will receive a 1 GB data voucher as reimbursement for participating in this study.

Confidentiality:

All identifying data will be handled with confidentiality, and no one other than the researcher, will have access to this information (e-mail addresses). Each participant will be assigned a

Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 2357 | Fax +27 (0)12 420 3517
Email ldia.pottas@up.ac.za | www.up.ac.za

unique code upon completion of the survey, which will be used during data analysis and interpretation of findings. The organisation will act as a go-between between the researcher and the participants for the distribution of the link to the survey. The researcher will not have access to the contact details of prospective participants except for participants who provide their own email addresses in the survey.

Informed Consent:

The purpose, procedures as well as objectives of this study is outlined in this information letter and will be outlined for participants on the first page of the webpage. Informed consent, provided freely by Audiologists, is required for participation. Participants can withdraw from this study at any point in time without experiencing any negative consequences or having to provide an explanation.

Risks:

Due to the online nature of this study, there are no risks involved in participation in this study.

Release of findings:

The final research dissertation will be available in the University of Pretoria's online library. The results from this study will be submitted as a research article and may be shared in academic publications, seminars, and conference presentations.

Data storage:

Upon completion of the study, all data will be stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a period of 15 years. The data will also be available on the University of Pretoria's Repository (Figshare), password-protected. All data obtained from this study may be used in future research projects.

If you agree to distribute the online survey on your platform, kindly complete the consent slip below. Please copy and paste the consent slip information onto an official association letterhead before signing, and if possible, add an official association stamp.

Your favourable consideration is appreciated. Feel free to contact us should you have any questions.

Thank you in advance for your time and cooperation.

Yours sincerely,


Ms. Corlien Venter
Researcher

079 463 1712
corlien.venter@gmail.com


Prof. Lidia Pottas
Supervisor

012 420 2815
lidia.pottas@up.ac.za


Dr. Talita Le Roux
Supervisor

012 420 4884
talita.leroux@up.ac.za



Please put this section on your official letterhead and insert your official stamp in the space provided.

Herewith I, _____ (name and surname) from
_____ (name of organisation) grant permission
for the distribution of this survey via our online platform. I acknowledge that I have received
the necessary information about this study and have had the opportunity to ask questions
regarding this project. I acknowledge that the information obtained will only be used for the
research purposes as specified above.

I give permission that audiologists registered with the *South African Academy of Audiologists*
(SAAA) may be approached and recruited for participation in the research study titled:
Educational Audiology service delivery in South Africa: Perceptions and practices of
audiologists. For the sake of confidentiality, SAAA agrees to act as a go-between between
the researcher and audiologists registered with the SAAA and *contact details of SAAA*
participants will not be provided to the researcher.

Title, name, surname

Date

Attention: South African Speech-Language-Hearing Association (SASLHA) October 2022

Re: Permission to distribute a survey to audiologists regarding their perceptions and practices of service delivery of educational audiology in South Africa

I am a postgraduate student at the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I am conducting research in fulfilment of a masters' degree in Audiology (MA Audiology). This study aims to describe the perceptions and practices of audiologists regarding the service delivery of educational audiology in South Africa. This study attempts to collect data from Audiologists practicing in South Africa.

I have developed an online survey for the purpose of this study and would like to request your assistance in distributing this online survey via your email and social media platforms.

Title: *Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*

Researcher: Corlien Venter

Study Leaders: Prof Lidia Pottas and Dr Talita le Roux

Research Design:

This study will have a mixed-method explanatory design, whereby phase one will comprise the completion of an online survey and phase two will comprise online focus groups.

Participants:

Practicing South African Audiologists registered with the HPCSA.

Procedures:

Participants will be expected to complete an online survey using the Qualtrics platform. Prospective participants will receive an email from your organisation containing the link to the online survey (thus, SAAA will distribute the link to the survey, not the researcher). For the sake of confidentiality, the researcher will not have access to the prospective participants' contact details. The first page of the webpage will contain the informed consent form. If participants wish to participate, a virtual "click to accept" button will indicate their consent to participate voluntarily in the study. Audiologists who meet this study's criteria and whom the researcher knows personally will also be contacted to request their participation in this study. Once they have granted permission the link to the survey will be sent to them. Only participants who have given consent will be granted access to the survey. The survey will take approximately 15 minutes to complete. In the final question of the survey, participants will be asked whether they would be willing to participate in an online focus group, as the second phase of this study. If participants are willing to participate in this second phase of the study, they will be requested to provide their email addresses. Only participants who indicate their willingness to participate in the online focus groups will be contacted by the researcher via email to confirm a date and time for these focus group discussions. Additionally, after the completion of the focus groups, each participant in each focus group will receive a 1 GB data voucher as reimbursement for participating in this study.

Confidentiality:

All identifying data will be handled with confidentiality, and no one other than the researcher, will have access to this information (e-mail addresses). Each participant will be assigned a unique code upon completion of the survey, which will be used during data analysis and

unique code upon completion of the survey, which will be used during data analysis and interpretation of findings. The organisation will act as a go-between between the researcher and the participants for the distribution of the link to the survey. The researcher will not have access to the contact details of prospective participants except for participants who provide their own email addresses in the survey.

Informed Consent:

The purpose, procedures as well as objectives of this study is outlined in this information letter and will be outlined for participants on the first page of the webpage. Informed consent, provided freely by Audiologists, is required for participation. Participants can withdraw from this study at any point in time without experiencing any negative consequences or having to provide an explanation.

Risks:

Due to the online nature of this study, there are no risks involved in participation in this study.

Release of findings:

The final research dissertation will be available in the University of Pretoria's online library. The results from this study will be submitted as a research article and may be shared in academic publications, seminars, and conference presentations.

Data storage:

Upon completion of the study, all data will be stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a period of 15 years. The data will also be available on the University of Pretoria's Repository (Figshare), password-protected. All data obtained from this study may be used in future research projects.

If you agree to distribute the online survey on your platform, kindly complete the consent slip below. Please copy and paste the consent slip information onto an official association letterhead before signing, and if possible, add an official association stamp.

Your favourable consideration is appreciated. Feel free to contact us should you have any questions.

Thank you in advance for your time and cooperation.

Yours sincerely,




Ms Corlien Venter
Researcher

079 463 1712
corlien.venter@gmail.com



Prof Lidia Pottas
Supervisor

012 420 2815
lidia.pottas@up.ac.za



Dr Talita Le Roux
Supervisor

012 420 4884
talita.leroux@up.ac.za



Please put this section on your official letterhead and insert your official stamp in the space provided.

Herewith I, _____ (name and surname) from
_____ (name of organisation) grant permission
for the distribution of this survey via our online platform. I acknowledge that I have received
the necessary information about this study and have had the opportunity to ask questions
regarding this project. I acknowledge that the information obtained will only be used for the
research purposes as specified above.

I give permission that audiologists registered with the *South African Academy of Audiologists*
(SAAA) may be approached and recruited for participation in the research study titled:
Educational Audiology service delivery in South Africa: Perceptions and practices of
audiologists. For the sake of confidentiality, SAAA agrees to act as a go-between between
the researcher and audiologists registered with the SAAA and *contact details of SAAA*
participants will not be provided to the researcher.

Title, name, surname

Date

Attention: Audiology Private Practice Forum (APPF)

October 2022

Re: Permission to distribute a survey to audiologists regarding their perceptions and practices of service delivery of educational audiology in South Africa

I am a postgraduate student at the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I am conducting research in fulfilment of a masters' degree in Audiology (MA Audiology). This study aims to describe the perceptions and practices of audiologists regarding the service delivery of educational audiology in South Africa. This study attempts to collect data from Audiologists practicing in South Africa.

I have developed an online survey for the purpose of this study and would like to request your assistance in distributing this online survey via your email and social media platforms.

Title: *Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*

Researcher: Corlien Venter

Study Leaders: Prof Lidia Pottas and Dr Talita le Roux

Research Design:

This study will have a mixed-method explanatory design, whereby phase one will comprise the completion of an online survey and phase two will comprise online focus groups.

Participants:

Practicing South African Audiologists registered with the HPCSA.

Procedures:

Participants will be expected to complete an online survey using the Qualtrics platform. Prospective participants will receive an email from your organisation containing the link to the online survey (thus, SAAA will distribute the link to the survey, not the researcher). For the sake of confidentiality, the researcher will not have access to the prospective participants' contact details. The first page of the webpage will contain the informed consent form. If participants wish to participate, a virtual "click to accept" button will indicate their consent to participate voluntarily in the study. Audiologists who meet this study's criteria and whom the researcher knows personally will also be contacted to request their participation in this study. Once they have granted permission the link to the survey will be sent to them. Only participants who have given consent will be granted access to the survey. The survey will take approximately 15 minutes to complete. In the final question of the survey, participants will be asked whether they would be willing to participate in an online focus group, as the second phase of this study. If participants are willing to participate in this second phase of the study, they will be requested to provide their email addresses. Only participants who indicate their willingness to participate in the online focus groups will be contacted by the researcher via email to confirm a date and time for these focus group discussions. Additionally, after the completion of the focus groups, each participant in each focus group will receive a 1 GB data voucher as reimbursement for participating in this study.

Confidentiality:

All identifying data will be handled with confidentiality, and no one other than the researcher, will have access to this information (e-mail addresses). Each participant will be assigned a

unique code upon completion of the survey, which will be used during data analysis and interpretation of findings. The organisation will act as a go-between between the researcher and the participants for the distribution of the link to the survey. The researcher will not have access to the contact details of prospective participants except for participants who provide their own email addresses in the survey.

Informed Consent:

The purpose, procedures as well as objectives of this study is outlined in this information letter and will be outlined for participants on the first page of the webpage. Informed consent, provided freely by Audiologists, is required for participation. Participants can withdraw from this study at any point in time without experiencing any negative consequences or having to provide an explanation.

Risks:

Due to the online nature of this study, there are no risks involved in participation in this study.

Release of findings:

The final research dissertation will be available in the University of Pretoria's online library. The results from this study will be submitted as a research article and may be shared in academic publications, seminars, and conference presentations.

Data storage:

Upon completion of the study, all data will be stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a period of 15 years. The data will also be available on the University of Pretoria's Repository (Figshare), password-protected. All data obtained from this study may be used in future research projects.

If you agree to distribute the online survey on your platform, kindly complete the consent slip below. Please copy and paste the consent slip information onto an official association letterhead before signing, and if possible, add an official association stamp.

Your favourable consideration is appreciated. Feel free to contact us should you have any questions.

Thank you in advance for your time and cooperation.

Yours sincerely,


Ms Corlien Venter
Researcher
079 463 1712
corlien.venter@gmail.com


Prof Lidia Pottas
Supervisor
012 420 2815
lidia.pottas@up.ac.za


Dr Talita Le Roux
Supervisor
012 420 4884
talita.leroux@up.ac.za

Insert your official stamp here

Please put this section on your official letterhead and insert your official stamp in the space provided.

Herewith I, _____ (name and surname) from
_____ (name of organisation) grant permission
for the distribution of this survey via our online platform. I acknowledge that I have received
the necessary information about this study and have had the opportunity to ask questions
regarding this project. I acknowledge that the information obtained will only be used for the
research purposes as specified above.

I give permission that audiologists registered with the *South African Academy of Audiologists*
(SAAA) may be approached and recruited for participation in the research study titled:
Educational Audiology service delivery in South Africa: Perceptions and practices of
audiologists. For the sake of confidentiality, SAAA agrees to act as a go-between between
the researcher and audiologists registered with the SAAA and *contact details of SAAA*
participants will not be provided to the researcher.

Title, name, surname

Date

Appendix C: Letters of consent SAAA, SASLHA and APPF



Herewith I, Lucretia Petersen (name and surname) from the South African Association of Audiologists (SAAA) (name of organisation) grant permission for the distribution of this survey via our online platform. I acknowledge that I have received the necessary information about this study and have had the opportunity to ask questions regarding this project. I acknowledge that the information obtained will only be used for the research purposes as specified above.

I give permission that audiologists registered with the *South African Academy of Audiologists* (SAAA) may be approached and recruited for participation in the research study titled: *Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*. For the sake of confidentiality, SAAA agrees to act as a go-between between the researcher and audiologists registered with the SAAA and contact details of SAAA participants will not be provided to the researcher.

Mrs Lucretia Petersen
SAAA President

21 November 2022





SASLHA
South African Speech-Language-Hearing Association

Local Tel : 0861 113 297
Address : P. O. Box 1690 Umhlange Rocks
4320
Email : admin@saslha.co.za
Web : www.saslha.co.za

18 October, 2022

Dear Ms Venter

Provisional permission granted to distribute research survey to SASLHA members

Researcher: Corlien Venter

Supervisors: Prof Lidia Pottas and Dr Talita le Roux.

Title of study: Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists

On behalf of the SASLHA Research and Education Committee, I acknowledge receipt of your request to distribute your research participation invitation to SASLHA members via email. Your application has been reviewed and conditionally approved following full ethical clearance by your university and submission of the Ethics Clearance letter to SASLHA. You will also need to attend to the suggested edits on the SASLHA research template. Please submit your edits and full ethics clearance letter as soon as you receive it for the distribution process to continue.

Kind regards

Nola Chambers, PhD
Research and Education Committee
SASLHA



Herewith I, Kara Hoffman from The Audiology Private Practice Forum (APPF) grant permission for the distribution of this survey via our online platform. I acknowledge that I have received the necessary information about this study and have had the opportunity to ask questions regarding this project. I acknowledge that the information obtained will only be used for the research purposes as specified above.

I give permission that audiologists registered with the *Audiology Private Practice Forum*

(APPF) may be approached and recruited for participation in the research study titled: *Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*. For the sake of confidentiality, APPF agree to act as a go-between between the researcher and audiologists registered with the APPF and contact details of APPF participants will not be provided to the researcher

Dr Kara Hoffman (Au.D)

18-11-2022

Title, name, surname

Date

partners@appf.co.za

www.appf.co.za

Appendix D: Informed consent letter to participants

PHASE ONE: SURVEY



Faculty of Humanities

Fakulteit Geesteswetenskappe
Lefapha la Bomotheo



Department of Speech-Language Pathology and Audiology

Dear Audiologist,

October 2022

Re: Permission to participate in a research study regarding the perceptions and practices regarding the service delivery of educational audiology in South Africa

I am a postgraduate student at the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I am conducting research in fulfilment of a masters' degree in Audiology (MA Audiology). The aim of this study is to describe the perceptions and practices of audiologists regarding the service delivery of educational audiology. This study attempts to collect data from Audiologists practicing in South Africa.

Title: *Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*

Researcher: Corlien Venter

Study Leaders: Prof Lidia Pottas and Dr Talita le Roux

Research Design:

This study will have a mixed-method explanatory design, whereby phase one will comprise the completion of an online survey and phase two will comprise online focus groups.

Participants:

Practicing South African Audiologists registered with the HPCSA.

Procedures:

You will be expected to complete an online survey using the Qualtrics platform. You will receive an email containing the link to the online survey and the first page of the webpage will contain the informed consent form. If you wish to participate, a virtual "click to accept" button will be used to indicate your consent to voluntarily participate in the study. Audiologists who meet this study's criteria and whom the researcher knows personally will also be contacted to request their participation in this study. Once you have granted permission, the link to the survey will be sent to you. Only participants who have given consent will be granted access to the survey. The survey will take approximately 15 minutes to complete. In the final question of the survey, you will be asked whether you would be willing to participate in an online focus group, as a second phase of this study. If participants are willing to participate in this second phase of the study, they will be requested to provide their email addresses. Only participants who indicate their willingness to participate in the online focus groups will be contacted by the researcher via email to confirm a date and time for these focus group discussions.

Confidentiality:

All identifying data will be handled with confidentiality and no one, other than the researcher, will have access to this information (e-mail addresses). Each participant will be assigned a unique code upon completion of the survey which will be used during data analysis and interpretation of findings.

Informed Consent:

The purpose, procedures as well as objectives of this study is outlined in this information letter and will be outlined for participants on the first page of the webpage. Informed consent, provided freely by you, is required for participation. You can withdraw from this study at any point in time without experiencing any negative consequences or having to provide an explanation.

Risks:

Due to the online nature of this study, there are no risks involved for participation in this study.

Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 2357 | Fax +27 (0)12 420 3517

Release of findings:

The final research dissertation will be available in the University of Pretoria's online library. The results from this study will be submitted as a research article and may be shared in academic publications, seminars, and conference presentations.

Ethical clearance:

Ethical clearance was obtained for this project by the Department of Speech-Language Pathology and Audiology Research Committee.

Data storage:

Upon completion of the study, all data will be stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a period of 15 years. The data will also be available on the University of Pretoria's Repository (Figshare), which is password protected. All data obtained from this study may be used in future research projects.

Feel free to contact the researcher (corlien.venter@gmail.com) should you have any questions regarding this study.

By selecting the "Yes" option below, I agree to voluntarily participate in the study entitled "*Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*". I acknowledge that my email address will only be used (a) to withdraw my data should I choose to withdraw from this study to (b) for the researcher to contact me should I agree to participate in phase two of this study. I hereby give permission that all data collected may be used for research purposes (for the current study as well as for future studies) and for publication in scientific journals. I am aware that confidentiality will be maintained. I acknowledge that I have received the necessary information about this study and have had the opportunity to ask questions regarding this study.

☐ Yes, I give consent

☐ No, I do not give consent

Thank you in advance for your time and cooperation.

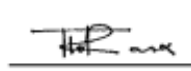
Yours sincerely,



Ms Corlien Venter
Researcher
079 463 1712
corlien.venter@gmail.com



Prof Lidia Pottas
Supervisor
012 420 2815
lidia.pottas@up.ac.za



Dr Talita le Roux
Supervisor
012 420 4884
talita.leroux@up.ac.za

PHASE TWO: FOCUS GROUP DISCUSSION



Faculty of Humanities

Fakulteit Geesteswetenskappe
Lefapha la Bomo



Department of Speech-Language Pathology and Audiology

Dear Audiologist,

October 2022

Re: Permission to participate in phase two of a research study regarding the perceptions and practices regarding the service delivery of educational audiology in South Africa

I am a postgraduate student at the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I am conducting research in fulfilment of a masters' degree in Audiology (MA Audiology). This study aims to describe audiologists' perceptions and practices regarding the service delivery of educational audiology. This study attempts to collect data from Audiologists practicing in South Africa.

Title: *Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*

Researcher: Corlien Venter

Study Leaders: Prof Lidia Pottas and Dr Talita le Roux

Research Design:

This study will have a mixed-method explanatory design, whereby phase one will comprise the completion of an online survey and phase two will comprise online focus groups.

Participants:

Practicing South African Audiologists registered with the HPCSA.

What will be expected from me if I participate?

You will be expected to participate in an online focus group, discussing your perspectives about Educational Audiology service delivery. If you are willing to participate, you will receive a link to a Google Form to indicate your availability for this focus group discussion. The focus group will be held on Microsoft Teams, and you will be provided with a link to the online discussion a week before the agreed-upon date and time. You will also receive a reminder e-mail the day before the focus group discussion as well as one hour prior to the discussion. The team conducting the focus group will consist of the primary researcher and of the primary researcher and one of the study leaders, in the role of a notetaker. This focus group will be audio-and video-recorded (if you are willing to switch on your video) and will take approximately 45 – 60 minutes of your time. If you are willing to participate in the focus group, you will receive a 1 GB data voucher as reimbursement for participating in this study after the conclusion of the focus group discussion.

Confidentiality:

All identifying data will be handled with confidentiality, and no one other than the researcher, will have access to this information (e-mail addresses and video-and audio-recordings). The focus group discussions will be recorded to ensure accurate transcriptions. During the transcribing process, each participant will be assigned a unique code which will not allow any participant to be linked to any specific statement. The unique code will also be used during data analysis and interpretation of findings.

Informed Consent:

The purpose, procedures, and objectives of this study are outlined in this information letter and will be discussed at the beginning of each focus group. Informed consent, provided freely by you, is required for participation. You can withdraw from this study at any point in time without experiencing any negative consequences or having to provide an explanation.

Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 2357 | Fax +27 (0)12 420 3517
Email lidia.pottas@up.ac.za | www.up.ac.za

Risks:

Due to the online nature of this discussion, there are no risks involved in participation in this study.

Release of findings:

The final research dissertation will be available in the University of Pretoria's online library. The results from this study will be submitted as a research article and may be shared in academic publications, seminars, and conference presentations.

Ethical clearance:

Ethical clearance was obtained for this project by the Department of Speech-Language Pathology and Audiology Research Committee.

Data storage:

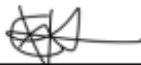
Upon completion of the study, all data will be stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a period of 15 years. The data will also be available on the University of Pretoria's Repository (Figshare), password-protected. All data obtained from this study may be used in future research projects.

Feel free to contact the researcher (corlien.venter@gmail.com) should you have any questions regarding this study.

If you agree to participate in this online focus group, kindly complete the consent slip below and return it to the researcher via email (corlien.venter@gmail.com) within seven (7) days.

Thank you in advance for your time and cooperation.


Yours sincerely,



Ms Corlien Venter
Researcher
079 463 1712
corlien.venter@gmail.com



Prof Lidia Pottas
Supervisor
012 420 2815
lidia.pottas@up.ac.za



Dr Talita le Roux
Supervisor
012 420 4884
talita.leroux@up.ac.za

By signing this consent slip, I **agree to voluntarily participate** in the study entitled "*Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*". I give permission that all data collected may be used for research purposes (for the current study as well as for future studies) and for publication in scientific journals. I give permission that the focus group discussion may be recorded. I am aware that confidentiality will be maintained. I acknowledge that I have received the necessary information about this study and have had the opportunity to ask questions regarding this study.

Signature of participant
Title, name, surname

Date

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Appendix E: Survey



Faculty of Humanities

Fakulteit Geesteswetenskappe
Lefapha la Bomotho



Department of Speech-Language Pathology and Audiology

Dear prospective participant,

Letter of informed consent to participate in an online survey regarding the perceptions and practices regarding the service delivery of educational audiology in South Africa

Who can participate and what will be expected of me from?

All audiologists in South Africa who are practicing and registered with the HPCSA are eligible to participate. You will only be expected to complete an online survey which will take approximately 15 minutes to complete.

Which ethical principles are applicable in this study?

Ethical clearance for this study has been obtained from the Faculty of Humanities' Research Ethics Committee, University of Pretoria. Participation in this study is voluntary and you can withdraw from this study at any point in time without experiencing any negative consequences or having to provide an explanation. All identifying data will be handled with confidentiality and no one, other than the researcher, will have access to this information (e-mail addresses). You will be assigned a unique code upon completion of the survey which will be used during data analysis and interpretation of findings. The final research dissertation will be available in the University of Pretoria's online library. The results from this study will be submitted as a research article and may be shared in academic publications, seminars, and conference presentations.

Risks:

Due to the online nature of this study, there are no risks involved for participation in this study.

Data storage:

Upon completion of the study, all data will be stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a period of 15 years. The data will also be available on the University of Pretoria's Repository (Figshare), which is password protected. All data obtained from this study may be used in future research projects.

Feel free to contact the researcher (corlien.venter@gmail.com) should you have any questions regarding this study.

By selecting the "Yes" option below, I agree to voluntarily participate in the study entitled "*Educational Audiology service delivery in South Africa: Perceptions and practices of audiologists*". I acknowledge that my email address will only be used (a) to withdraw my data should I choose to withdraw from this study to (b) for the researcher to contact me should I agree to participate in phase two of this study. I hereby give permission that all data collected may be used for research purposes (for the current study as well as for future studies) and for publication in scientific journals. I am aware that confidentiality will be maintained. I acknowledge that I have received the necessary information about this study and have had the opportunity to ask questions regarding this study.

☐ Yes, I give consent

☐ No, I do not give consent

Thank you in advance for your time and cooperation.

The current study aims to determine what the perceptions and practices are of South African Audiologists regarding the service delivery of educational audiology.

Please answer all the questions as honestly as possible.

1. Indicate the platform through which you gained access to this survey:

- ☐ South African Speech-Language and Hearing Association (SASLHA)
☐ South African Academy of Audiologists (SAAA)
☐ Audiology Private Practice Forum (APPF)
☐ Social media ☐ Word of mouth

2. What is your highest audiological qualification?

- ☐ Bachelor's Degree ☐ Master's Degree ☐ Doctoral Degree

3. What is the primary province where you practice as audiologist?

- ☐ Gauteng ☐ Northern Cape ☐ Limpopo
☐ Free-State ☐ Western Cape ☐ North-West
☐ Eastern Cape ☐ Mpumalanga ☐ KwaZulu-Natal

4. What is your primary work setting currently?

- ☐ Private practice
☐ Government hospital/clinic ☐ Industry (Occupational Audiologist)
☐ Audiological representative for a company ☐ Academia
☐ School setting
☐ Other (please specify): _____

5. How many years have you been practising as an audiologist?

Indicate years ____

Section B

1. In your own words, how would you define educational audiology service delivery? (Irrespective of your current primary work setting)

2. In your own words, how would you define aural rehabilitation?

3. Are school-aged children (Grade R – Grade 12) part of your caseload?

- ☐ Yes
☐ No

4. For the following section, please indicate your level of agreement with the following statements with regard to service delivery to school-aged children (Grade R – Grade 12).

Statement: Perceived <u>roles</u> of an educational audiologist	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It is the role of the educational audiologist to train teachers to support learners with hearing loss.	1	2	3	4	5
It is the role of educational audiologists to collaborate with other professionals when managing learners with hearing loss.	1	2	3	4	5
Educational audiologists are responsible for providing appropriate hearing devices to learners with hearing loss	1	2	3	4	5
It is important for an educational audiologist to provide hearing screening services in a specialized education setting.	1	2	3	4	5
Educational audiologists should provide appropriate suggestions for classroom accommodations to support learners with hearing loss.	1	2	3	4	5
When managing learners with hearing loss, educational audiologists have a responsibility to work in partnership with other health professionals (e.g., educational psychologists, speech-language therapists, etc.)	1	2	3	4	5
An educational audiologist must assess the educational impact of hearing loss to support learners with hearing loss.	1	2	3	4	5
It is important for an educational audiologist to provide hearing screening services in a general education setting.	1	2	3	4	5
Educational audiologists should provide information about hearing loss to teachers.	1	2	3	4	5
Providing appropriate amplification to learners with hearing loss is an important role of the educational audiologist.	1	2	3	4	5

Statement: Perceived <u>responsibilities</u> of an educational audiologist	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Administering a school-based hearing screening program is the responsibility of an educational audiologist.	1	2	3	4	5
Educational audiologists have to assess learners' functional listening performance.	1	2	3	4	5
Educational audiologists have a responsibility to counsel parents, teachers, and learners on hearing loss.	1	2	3	4	5
The educational audiologist should ensure that learners' hearing devices is operating optimally.	1	2	3	4	5
It is the responsibility of the educational audiologist to facilitate group activities with learners with hearing loss.	1	2	3	4	5
Ensuring recommendations are followed by the team managing a learner with hearing loss is the responsibility of the educational audiologist.	1	2	3	4	5
Educating parents and teachers about ways to prevent hearing loss is necessary for an educational audiologist.	1	2	3	4	5
An educational audiologist should be in charge of managing a school-based hearing screening program.	1	2	3	4	5
It is the responsibility of the educational audiologist to perform classroom acoustic measurements.	1	2	3	4	5
Working with a team is an important responsibility of an educational audiologist.	1	2	3	4	5
The educational audiologist must coach families of learners with hearing loss to participate in group activities for learners with hearing loss	1	2	3	4	5
It is the responsibility of the educational audiologist to ensure that learners' hearing devices are functioning optimally.	1	2	3	4	5

5. Please indicate whether you have experience providing the following services to school-aged children, and if so, how often do you provide this service?

Service	How often do you provide these services?					How competent do you feel in providing this service?
	Never	Once	Seldom (less than once a month)	Often (at least once a week)	Most of the time (more than twice a week)	
Observation in the classroom of school-aged children						Choose an item.
Providing classroom recommendations to teachers e.g., carpets, curtains, etc.						Choose an item.
Administering a school-based hearing screening program						Choose an item.
Collaboration with other health professionals (e.g., speech-language therapists)						Choose an item.
Fittings of hearing aids and assistive listening devices for school-aged children						Choose an item.
Evaluation of classroom acoustics (e.g., with a sound level meter)						Choose an item.
Collaboration with parents in managing the learner with hearing loss.						Choose an item.
Teacher training (e.g., providing information on different degrees of hearing loss and activities to improve learners' listening skills)						Choose an item.
Hearing loss prevention (e.g., developing a hearing conservation program, access to hearing protection devices, classroom presentation on the prevention of hearing loss)						Choose an item.

6. To what extent do you think adding community service posts in government schools (instead of only in hospital/clinical settings) could improve the service delivery of Educational Audiology in South Africa? Choose an item.
7. If you don't provide services to school-aged children, please indicate the possible reasons. (Select all the applicable options)
- ☐ I do not have time ☐ I prefer not to provide these services
- ☐ It is not my area of expertise ☐ I am not properly trained
- ☐ I have difficulty getting access to schools
- ☐ Not within the scope of the practice where I am working
- ☐ Other (please specify): _____
8. If you do provide services to school-aged children, please indicate the possible challenges you face. Mark all that apply.
- ☐ Cultural differences ☐ Lack of adequate compensation
- ☐ Language differences ☐ Lack of cooperation from parents/learners
- ☐ Feeling unequipped ☐ Lack of cooperation of teachers
- ☐ I face no challenges ☐ Lack of access to schools
- ☐ Other (please specify): _____
9. To what extent did your undergraduate training equip you to provide audiological services in schools? Choose an item.
10. If you are willing to be contacted to participate in an online focus group discussion, elaborating on your perspectives on the service delivery of educational audiology (phase 2 of this study), please click the appropriate option below and provide your email address.
- ☐ YES, I give permission that the researcher may contact me to participate in a once-off online focus group discussion
- ☐ NO, I do not give permission that the researcher may contact me to participate in a once-off online focus group discussion
- Email address:** Click or tap here to enter text.

Appendix F: Focus group guide and prompts



Faculty of Humanities

Fakulteit Geesteswetenskappe
Lefapha la Bomotho



Department of Speech-Language Pathology and Audiology

FOCUS GROUP ON THE PERSPECTIVES AND PRACTICES OF AUDIOLOGISTS REGARDING THE SERVICE DELIVERY OF EDUCATIONAL AUDIOLOGY

Introductions (2 min):

I am Corlien Venter, I am the primary researcher on this study and thank you so much for being here. All of you qualified audiologists from all over South Africa. So, let's begin with introducing ourselves and saying where we're from and in what context we work. I am Corlien, I am currently living in Gauteng, and I am doing my master's degree.

Ground rules & Guidelines (5min):

Before we begin, let's lay some ground rules.

- There are no right/wrong answers, we want to know what YOU think and do – no judgement.
- What is said in this focus group stays here. It will not be shared with anyone else, and the recorded file will be saved in a password-protected folder to which only I have access.
- This session will be recorded, no identifying information will be used at any point in the description of findings, and you will remain anonymous.

1. What is Educational Audiology to you? (Defining EA) (8 min)
2. Why/Why not do you regard yourself as an Educational Audiologist? / Feel comfortable providing services to children in a school context? (8 min)
3. What challenges do you think the service delivery of EA face in SA? (5 min)
4. Why do/ don't you think Educational Audiologists are a necessity in South Africa? (10 min)
5. What could be done to improve the service delivery of educational audiology in South Africa? (7 min)

Let's recap.... (5 min)

6. Is there anything you think we missed, that you would like to add or that you would like me to highlight? (5 min)

Thank you, everyone. You will receive an email with your voucher within the next hour.

Prompts:

- Can you talk about that more?
- Could you please elaborate?
- Can you give me an example?
- So am I correct in saying that you mean...

Appendix G: Data storage form



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

FACULTY OF HUMANITIES
RESEARCH ETHICS COMMITTEE

Declaration for the storage of research data and/or documents

I/ We, the principal researcher(s) Corlien Mentz

and supervisor(s) Lidia Pottas and Talita le Roux

of the following study, titled Educational audiology service delivery in South Africa: Perspectives, practices and challenges of audiologists

will be storing all the research data and/or documents referring to the above-mentioned study in the following department: Speech-Language Pathology and Audiology

We understand that the storage of the mentioned data and/or documents must be maintained for a minimum of 15 years from the commencement of this study.

Start date of study: 01/01/2022

Anticipated end date of study: 06/09/2024

Year until which data will be stored: 2037

Name of Principal Researcher(s)	Signature	Date
Corlien Mentz		01/09/2024

Name of Supervisor(s)	Signature	Date
Lidia Pottas		4/9/2024
Talita le Roux		4/9/2024

Name of Head of Department	Signature	Date
Prof Jeannie van der Linde		4/9/2024

Appendix H: Checklist for Reporting Results of Internet E-Surveys (CHERRIES)

Checklist for Reporting Results of Internet E-Surveys (CHERRIES)

Checklist Item	Explanation	Explanations
Describe survey design	Describe target population, sample frame. Is the sample a convenience sample? (In "open" surveys this is most likely.)	A cross-sectional survey design was used. The target population was South African practicing audiologists registered with the HPCSA and purposive sampling was used.
IRB approval	Mention whether the study has been approved by an IRB.	N/A
Informed consent	Describe the informed consent process. Where were the participants told the length of time of the survey, which data were stored and where and for how long, who the investigator was, and the purpose of the study?	As soon as participants clicked the link to the survey, the informed consent page loaded immediately. The consent form contained the purpose of the study, a description of the target audience, a description of ethical principles applicable to the study (e.g., voluntary participation, participants' right to withdraw at any time, how confidentiality and anonymity would be ensured), outlined that there is no risk to the participants in participating in the study, described how the data would be stored, for how long and who would have access to the data, the contact information of the primary researcher and that it would take participants approximately 15 minutes to complete the survey.
Data protection	If any personal information was collected or stored, describe what mechanisms were used to protect unauthorized access.	Qualtrics captured participants' IP addresses and the statistician, as well as the primary researcher, had access to this information. The statistician signed a non-disclosure statement, and no identifying information will be released by the statistician who analyzed the data. Upon completion of the study, all relevant data will be stored electronically at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for a period of 15 years, as per the university's policy on data storage. The data will also be available on the University of Pretoria's Repository (Figshare), with an embargo of at least two years. Before the data will be uploaded onto the UP Figshare data repository, any identifying or sensitive information will be removed. The data obtained from this study may be used in future research projects.
Development and testing	State how the survey was developed, including whether the usability and technical functionality of the electronic questionnaire had been tested before fielding the questionnaire.	A self-developed electronic survey was compiled based on a compilation of published articles and protocols on school-age hearing screening. The the usability and technical functionality of the electronic questionnaire had been tested by the primary investigator, the supervisors and the statistician before being distributed.
Open survey versus closed survey	An "open survey" is a survey open for each visitor of a site, while a closed survey is only open to a sample which the investigator knows (password-protected survey).	This was an open survey, as prospective participants did not need a password to access the survey.
Contact mode	Indicate whether or not the initial contact with the potential participants was made on the Internet. (Investigators may also send out questionnaires by mail and allow for Web-based data entry.)	This survey was distributed through various channels. Three different professional boards were contacted to share the survey with the audiologists registered with them (SAAA, SASLHA, APPF). A social media post was also published on different social media platforms.

		Additional invites were also sent to potential participants via social media.
Advertising survey	the How/where was the survey announced or advertised? Some examples are offline media (newspapers), or online (mailing lists – If yes, which ones?) or banner ads (Where were these banner ads posted and what did they look like?). It is important to know the wording of the announcement as it will heavily influence who chooses to participate. Ideally the survey announcement should be published as an appendix.	The survey was sent through the mailing list of three different professional boards and was posted on social media (with an electronic link) with the permission of group administrators. Additional invitations to participate were sent to audiologists who were not able to access those social media platforms. The survey announcement is published as an appendix in the dissertation of the primary investigator.
Web/E-mail	State the type of e-survey (eg, one posted on a Web site, or one sent out through e-mail). If it is an e-mail survey, were the responses entered manually into a database, or was there an automatic method for capturing responses?	The survey was distributed via social media platforms. The Qualtrics™ XM software was used for the distribution of the survey and the survey was open from November 2022 to February 2023. Qualtrics automatically captures the data which can then be exported to various software packages such as Microsoft Excel and SPSS.
Context	Describe the Web site (for mailing list/newsgroup) in which the survey was posted. What is the Web site about, who is visiting it, what are visitors normally looking for? Discuss to what degree the content of the Web site could pre-select the sample or influence the results. For example, a survey about vaccination on a anti-immunization Web site will have different results from a Web survey conducted on a government Web site	South African Speech-Language and Hearing Association (SASLHA https://saslha.co.za/), the South African Association of Audiologists (SAAA https://www.audiologysa.co.za/) and the Audiology Private Practice Forum (APPF https://appf.co.za/) are professional boards that audiologists can register with. Additionally, Facebook (three different groups, the primary researcher's personal account and the statistician's personal account) as well as LinkedIn (the researcher's personal account and the statistician's personal account) were utilised for the distribution of the survey. Facebook is a social networking site, whereas

		LinkedIn is the world's largest professional network on the internet.
Mandatory/voluntary	Was it a mandatory survey to be filled in by every visitor who wanted to enter the Web site, or was it a voluntary survey?	Voluntary survey
Incentives	Were any incentives offered (eg, monetary, prizes, or non-monetary incentives such as an offer to provide the survey results)?	No incentives were offered.
Time/Date	In what timeframe were the data collected?	November 2022 to February 2023
Randomization of items or questionnaires	To prevent biases items can be randomized or alternated.	The questions in the survey were not randomized.
Adaptive questioning	Use adaptive questioning (certain items, or only conditionally displayed based on responses to other items) to reduce number and complexity of the questions.	The survey had a total of 15 questions, of which 14 were mandatory. If respondents provided conditional responses, they were prompted to answer additional questions more in detail for qualitative purposes.
Number of Items	What was the number of questionnaire items per page? The number of items is an important factor for the completion rate.	There was a total of 5 questions per page.
Number of screens (pages)	Over how many pages was the questionnaire distributed? The number of items is an important factor for the completion rate.	The survey was distributed over 5 pages.
Completeness check	It is technically possible to do consistency or completeness checks before the questionnaire is submitted. Was this done, and if "yes", how (usually JavaScript)? An alternative is to check for completeness after the questionnaire has been submitted (and highlight mandatory items). If this has been done, it should be reported. All items should provide a non-response option such as "not applicable" or "rather not say", and	If an item in a question was left unanswered, the field would be highlighted to show the respondent that they still need to complete that field. Most of the questions were mandatory but a "not applicable" option was provided where applicable.

	selection of one response option should be enforced.	
Review step	State whether respondents were able to review and change their answers (e.g., through a Back button or a Review step which displays a summary of the responses and asks the respondents if they are correct).	Respondents did have the option of going back and changing their answers before final submission of the survey.
Unique site visitor	If you provide view rates or participation rates, you need to define how you determined a unique visitor. There are different techniques available, based on IP addresses or cookies or both.	Unless the researcher informs Qualtrics™ XM software not to capture IP addresses (this is done in Qualtrics by selecting "Anonymize response"), Qualtrics captures the IP address by default. In this study, Qualtrics captured the IP addresses which uniquely identifies a host. The statistician had access to each respondent's IP address and checked for duplicates.
View rate (Ratio of unique survey visitors/unique site visitors)	Requires counting unique visitors to the first page of the survey, divided by the number of unique site visitors (not page views!). It is not unusual to have view rates of less than 0.1 % if the survey is voluntary.	There were 106 unique survey visitors. There were 106 unique site visitors. Thus, ratio = $106/106 = 1$. Percentage = 100%.
Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	Count the unique number of people who filled in the first survey page (or agreed to participate, for example by checking a checkbox), divided by visitors who visit the first page of the survey (or the informed consents page, if present). This can also be called "recruitment" rate.	Although 106 unique respondents read the first page (consent page), one indicated that they did not give consent to participate in the study. Thus, recruitment ratio = $105/106 = 0.9906$. Recruitment percentage = 99.06%.
Completion rate (Ratio of users who finished the survey/users who agreed to participate)	The number of people submitting the last questionnaire page, divided by the number of people who agreed to participate (or submitted the first survey page). This is only relevant if there is a separate "informed consent" page or if the survey goes over several pages. This is a measure for attrition. Note that "completion" can	105 of the 105 respondents that gave informed consent submitted the questionnaire on the last page, thus ratio = $105/105 = 1$ and percentage = 100%

	involve leaving questionnaire items blank. This is not a measure for how completely questionnaires were filled in. (If you need a measure for this, use the word "completeness rate".)	
Cookies used	Indicate whether cookies were used to assign a unique user identifier to each client computer. If so, mention the page on which the cookie was set and read, and how long the cookie was valid. Were duplicate entries avoided by preventing users access to the survey twice; or were duplicate database entries having the same user ID eliminated before analysis? In the latter case, which entries were kept for analysis (eg, the first entry or the most recent)?	Qualtrics has the option to prevent multiple submissions by placing a cookie on the respondent's browser. If the respondent tries the survey again and clicks on the survey link a second time, Qualtrics sees this cookie and will not permit them to take the survey again. This was not done in this study. The reason being that this setting is recommend by Qualtrics in circumstances where the researcher offers an incentive or when the researcher is conducting a sensitive vote. In this study, the researcher was not offering incentives nor was the researcher conducting a sensitive vote. Thus, Cookies were not used to prevent multiple submissions. However, multiple submissions were checked for using the IP addresses of the respondents and there was only one duplicate, which was not removed, as audiologists working in the same office could have used the same computer.
IP check	Indicate whether the IP address of the client computer was used to identify potential duplicate entries from the same user. If so, mention the period of time for which no two entries from the same IP address were allowed (eg, 24 hours). Were duplicate entries avoided by preventing users with the same IP address access to the survey twice; or were duplicate database entries having the same IP address within a given period of time eliminated before analysis? If the latter, which entries were kept for analysis (eg, the first entry or the most recent)?	Unless the researcher informs Qualtrics™ XM software not to capture IP addresses (this is done in Qualtrics by selecting "Anonymize response"), Qualtrics captures the IP address by default. In this study, Qualtrics captured the IP addresses which uniquely identifies a host. The statistician had access to each respondent's IP address and checked for duplicates. There was only one duplicate, which was not removed, as audiologists working in the same office could have used the same computer.

Log file analysis	Indicate whether other techniques to analyze the log file for identification of multiple entries were used. If so, please describe.	No other techniques were used since the IP address uniquely identifies a host. Using the IP address to identify multiple entries were the only technique use to look for duplicates. There was only one duplicate, which was not removed, as audiologists working in the same office could have used the same computer.
Registration	In "closed" (non-open) surveys, users need to login first and it is easier to prevent duplicate entries from the same user. Describe how this was done. For example, was the survey never displayed a second time once the user had filled it in, or was the username stored together with the survey results and later eliminated? If the latter, which entries were kept for analysis (eg, the first entry or the most recent)?	IP addresses were used to check for duplicate entries.
Handling of incomplete questionnaires	Were only completed questionnaires analyzed? Were questionnaires which terminated early (where, for example, users did not go through all questionnaire pages) also analyzed?	Only data from respondents who completed the demographic questions as well as at least two other questions relevant to the study were analyzed.
Questionnaires submitted with an atypical timestamp	Some investigators may measure the time people needed to fill in a questionnaire and exclude questionnaires that were submitted too soon. Specify the timeframe that was used as a cut-off point and describe how this point was determined.	40 survey responses were excluded based on time. Qualtrics captures the time that respondents take to complete a questionnaire. All times were investigated by the statistician and all responses that took less than 5 minutes were excluded to enhance the credibility of this study.
Statistical correction	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for the non-representative sample; if so, please describe the methods.	None such methods were used. This was not necessary as we clearly describe the sample in the article.

Appendix I: Image for social media

Attention: All Audiologists, practicing in South Africa

What are your perceptions and practices regarding the service delivery of educational audiology?

I am a full-time Masters' student at UP and I need YOUR input. We want to find out what your thoughts and practices are in terms of Educational Audiology.

Criteria:

- Qualified Audiologists registered with the HPCSA
- You do NOT need to work in a school setting

Please assist me, by taking \pm 10 minutes to complete the survey, by clicking on this link:

https://qfreeaccountssjc1.az1.qualtrics.com/jfe/form/SV_2f6jOiU2w8FMGLs

Please feel free to contact the primary researcher any time via email: corlien.venter@gmail.com



Appendix J: Cronbach's alpha coefficient

Cronbach's alpha coefficient

Table 1: Factors (Roles of the educational audiologist) and Corresponding Cronbach's Alpha Coefficients

Factor	Items	Number of items	Cronbach's alpha
Factor 1: Instructional team members	V10: It is the role of educational audiologists to train teachers to support learners with hearing loss. V11: It is the role of educational audiologists to collaborate with other professionals when managing learners with hearing loss. V14: Educational audiologists should provide appropriate suggestions for classroom accommodations to support learners with hearing loss.	3	0.802
Factor 2: Service coordinator	V12: Educational audiologists are responsible for providing appropriate hearing devices to learners with hearing loss. V19_RS: It is not the role of educational audiologists to ensure learners with hearing loss have the appropriate hearing devices (reverse-scored)	2	0.624
Factor 3: Consultants	V15: When managing learners with hearing loss, educational audiologists have a responsibility to work in partnership with other health professionals (e.g., educational psychologists, speech-language therapists, etc.) V18_RS: Educational audiologists are not responsible for providing information about hearing loss to teachers (reverse-scored)	2	0.630

Table 2: Factors (responsibilities of educational audiologist) and Corresponding Cronbach's Alpha Coefficients

Factor	Items	Number of items	Cronbach's alpha
Factor 1: Habilitation of learners with hearing loss	V21: Educational audiologists have to assess learners' functional listening performance. V24: It is the responsibility of educational audiologists to facilitate group activities with learners with hearing loss. V25: It is the responsibility of educational audiologists to ensure that recommendations are followed by the team managing learners with hearing loss.	3	0.756
Factor 2: Ensuring optimal function of learners' hearing devices	V23: Educational audiologists should ensure that learners' hearing devices are operating optimally. V31: It is the responsibility of educational audiologists to ensure that learners' hearing devices are functioning optimally.	2	0.875
Factor 3: Identification of learners with hearing loss	V20: Administering a school-based hearing screening program is the responsibility of educational audiologists. V27: Educational audiologists should be in charge of managing a school-based hearing screening program.	2	0.807

Appendix K: Spearman correlation

Spearman correlations for frequency of service delivery and self-reported competency

Table 3: Spearman correlation for role of educational audiologists (n = 64)

		Instructional team member			Service coordinators	Consultants
		Train teachers to support learners with hearing loss.	Collaborate with other professionals	Provide appropriate suggestions for classroom accommodations.	Providing appropriate hearing devices to learners with hearing loss.	Collaboration with other health professionals
Train teachers to support learners with hearing loss	r	1.000	0.565*	0.368*	-	-
	s					
	p		<0.001	0.003	-	-
Collaborate with other professionals	r	0.565*	1.000	0.372*	-	-
	s					
	p	<0.001		0.003	-	-
Accommodations	r	0.368*	0.372*	1.000	-	-
	s					
	p	0.003	0.003		-	-
Collaborate with other professionals	r	0.565*	1.000	0.372*	-	-
	s					
	p	<0.001		0.003	-	-
It is not the role of educational audiologists to ensure learners with hearing loss have the appropriate hearing devices. (Reverse-scored)	r	-	-	-	0.572*	-
	s					
	p	-	-	-	<0.001	-
Educational audiologists are not responsible for providing information about hearing loss to teachers (reverse-scored)	r	-	-	-	-	0.426*
	s					
	p	-	-	-	-	<0.001

Table 4: Spearman correlation for responsibilities of educational audiologists (n = 64)

		Habilitation of learners with hearing loss			Ensuring optimal function of hearing devices	Identification of learners with hearing loss		
		Assess learners' functional listening performance	Facilitate group activities with learners with hearing loss	Ensure that recommendations are followed by the team managing learners with hearing loss.	Ensuring optimal function of learners' hearing devices	Provide hearing screening services in a specialized education setting	Provide hearing screening services in a general (mainstream) education setting	Administering a school-based hearing screening program
Assess learners' functional listening performance	rs	1.000	0.468*	0.434*	-	-	-	-
	p		<0.001	<0.001	-	-	-	-
Facilitate group activities with learners with hearing loss	rs	0.468*	1.000	0.617*	-	-	-	-
	p	<0.001		<0.001	-	-	-	-
Ensure that recommendations are followed by the team managing learners with hearing loss.	rs	0.434*	0.617*	1.000	-	-	-	-
	p	<0.001	<0.001		-	-	-	-
Ensuring optimal function of learners' hearing devices	rs	-	-	-	0.767*	-	-	-
	p	-	-	-	<0.001	-	-	-
Provide hearing screening services in a specialized education setting	rs	-	-	-	-	-	-	-
	p	-	-	-	-	0.514*	-	-
Administering a school-based hearing screening program	rs	-	-	-	-	64	-	-
	p	-	-	-	-	0.560*	0.577*	-
Managing a school-based hearing screening program.	rs	-	-	-	-	64	64	-
	p	-	-	-	-	0.445*	0.515*	0.656*

*Statistically significant ($p < 0.05$)

Appendix L: The consolidated Criteria for Reporting Qualitative Research (COREQ) checklist

Table 8: The consolidated Criteria for Reporting Qualitative Research (COREQ) checklist.

Topic	Item no.	Guide Questions/ Description	Additional information	Reported on page No.
Domain 1: Research team and reflexivity				
<i>Personal characteristics</i>				
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Corlien Mentz (CM)	-
Credentials	2	What were the researcher's credentials? E.g., PhD, MD	Corlien Mentz: MA Audiology (in progress), BA Audiology (from the university of Pretoria) Lidia Pottas: PhD, MA , B. Comm Path Talita le Roux: PhD, MA, B. Comm Path Marien Alet Graham: PhD, MSc Mathematical Statistics	-
Occupation	3	What was their occupation at the time of the study?	Corlien Mentz: Masters' student, Audiologist. Lidia Pottas: Associate Professor (Audiology) Talita le Roux: Associate Professor (Audiology) Marien Alet Graham: : Full Professor (Mathematics Education)	-
Gender	4	Was the researcher male or female?	Female	-
Experience and training	5	What experience or training did the researcher have?	Lidia Pottas and Talita le Roux are experienced in qualitative research and have published audiology qualitative research papers. They helped in training CM how to conduct the research according to Braun & Clarke (2021). Marien Alet Graham has experience in statistical analysis of data and data processing.	-
<i>Relationship with participants</i>				
Relationship established	6	Was a relationship established prior to study commencement?	With one participant the relationship established was just for the purpose of research. The researcher had a pre-existing relationship with 3 of the other participants, two were only professional and one the researcher knew personally.	-

Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	All participants received the research topic and completed a survey on the topic prior to taking part in the focus group. All participants knew that the research is part of a MA study.	-
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. bias, assumptions, reasons and interests in the research topic	No biases were identified.	-
Domain 2: Study design				
<i>Theoretical framework</i>				
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Thematic analysis combined with descriptive statistics.	6
<i>Participant selection</i>				
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Purposive sampling	6
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	Participants were recruited through the South African Speech-Language and Hearing Association (SASLHA), the South African Association of Audiologists (SAAA) and the Audiology Private Practice Forum (APPF), social media and word of mouth. Participants received an email with the link to the informed consent form and the survey through various platforms.	6
Sample size	12	How many participants were in the study?	64 (Phase one) 6 (Phase two)	6
Non-participation	13	How many people refused to participate or dropped out? Reasons?	One indicated "no" on the informed consent form. Some participants did not complete the entire survey and some participants took less than 5 minutes to complete the survey. This was deemed an unreliable response and	6

			these participants were excluded.	
Setting				
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Data was collected online through electronic survey platform (Qualtrics) and via Microsoft Teams.	6
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	No	-
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Presented in table 1	7
Data collection				
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Yes, in Appendix E No, the focus group guide was not piloted, but the supervisors (expert panel) gave input on the questions and it was adapted accordingly.	8
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	No	-
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Yes, Audio and video recording	-
Field notes	20	Were field notes made during and/or after the interview or focus group?	Yes	
Duration	21	What was the duration of the inter views or focus group?	1 hour 1 minute 44 seconds	
Data saturation	22	Was data saturation discussed?	One focus group discussion was held and all topics discussed. Initial data collection (phase one) was the survey – the focus group enhanced the data obtained from the survey.	8
Transcripts returned	23	Were transcripts returned to participants for comment and/or correction?	A summary was made by CM at the end of the focus group discussion and participants had the opportunity to correct/add information (member checking).	-
Domain 3: analysis and findings				
Data analysis				
Number of data coders	24	How many data coders coded the data?	Only the first author CM.	-

Description of the coding tree	25	Did authors provide a description of the coding tree?	Primary codes were identified by means of a colour-coding system and plotted onto a mind map. Thereafter the primary codes were checked again and condensed where necessary.	14 - 17
Derivation of themes	26	Were themes identified in advance or derived from the data?	Themes were identified from the data (inductive approach).	-
Software	27	What software, if applicable, was used to manage the data?	Qualtrics, SPSS and Microsoft Excel	
Participant checking	28	Did participants provide feedback on the findings?	No	-
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Yes	14 - 17
Data and findings consistent	30	Was there consistency between the data presented and the findings?	Yes	-
Clarity of major themes	31	Were major themes clearly presented in the findings?	Yes	14 - 17
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Yes	14 - 17

Appendix M: Proof of submission to a journal



Lidia Pottas <lidia.pottas@up.ac.za>

Submission received for Disability and Rehabilitation (Submission ID: 248036021)

1 message

IDRE-peerreview@journals.tandf.co.uk <IDRE-peerreview@journals.tandf.co.uk>
To: lidia.pottas@up.ac.za

11 June 2024 at 21:34



Dear Lidia Pottas,

A manuscript has been submitted on your behalf.

Submission ID	248036021
Manuscript Title	Educational Audiology service delivery in South Africa: Perspectives and practices of Audiologists
Journal	Disability and Rehabilitation

You have been identified as the main contact for this submission and will receive further updates from the Editorial Office. If you are requested to make a revision to your manuscript, the person who made the original submission will need to action this request.

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Kind Regards,
Disability and Rehabilitation Editorial Office

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