

# Barriers to and Facilitators of Implementing an Audiology Service Delivery Model in Mauritius' Public Healthcare Sector

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**Abstract:** *Background.* Audiology services are an integral part of providing hearing healthcare to the Mauritian population. *Aims/Objectives.* This study aimed to identify audiologists' perceptions of the barriers to and facilitators of implementing an audiology service delivery model in Mauritius. *Material and Methods.* A qualitative study was conducted using semi-structured telephonic interviews. Data obtained were scribed and transcribed, and inductive thematic analyses were used to identify themes and subthemes. Using convenience sampling, four audiologists from Mauritius' public healthcare sector were selected as the study sample. *Results.* The following main themes were identified during data analysis: infrastructure and resources—human and clinical resources and audiological settings; knowledge—administering tests and further training; protocol and guidelines—audiological norms and referral pathways; appointments—waiting list; technology—information systems and technological devices, and communication—explanation of test results and communication strategies. The results showed that the participants were aware of the various resources available for audiology services, but there were concerns regarding the implementation of standardized guidelines in audiology practice. *Conclusion.* Overall, the findings suggest that the public healthcare sector's sizeable availability of resources is conducive to early hearing detection and intervention, which in turn calls for changes to improve healthcare services to the Mauritian population by introducing an early hearing detection and intervention program consistent with international norms and guidelines.

**Keywords:** Audiology, Barriers, Facilitators, Service, Public Healthcare Sector

## 1. Introduction

The need for accessing audiological services across the world remains undisputed, largely because, globally, more than 1.5 billion people are currently living with hearing loss (HL), approximately half a billion of whom have “disabling HL” [1]. Disabling HL is defined as a HL greater than 40 decibels in the better hearing ear averaged over frequencies of 0.5, 1, 2, and 4 kilohertz in adults (15 years or older), and greater than 30 decibels in the better hearing ear in children (0 to 14 years). In the next three decades, the prevalence of HL is expected to increase significantly (56.1%) owing to population growth, increased life expectancy, and demographic shifts [2].

Unless properly addressed, disabling HL can significantly impact individuals, challenge their everyday lives, and even inflict a huge financial toll [1]. The estimated annual global loss associated with unaddressed HL is close to one trillion US dollars [1], including healthcare provision costs, productivity losses, care provision, and intangible costs owing to loss in quality of life and educational support [1]. All of these factors contribute to the continuous need for accessible hearing health services globally, and the demand for treatment is likely to grow in the coming years.

Currently, the delivery of audiology services in the public healthcare sector of Mauritius, an example of a low-and-middle income country, is traditional and conservative. Appointments for speech therapy and audiology

services typically occur in person at outpatient departments in regional hospitals, with practically no use of teletraining and telepractice. This may be due to the requirement of specialized equipment and trained personnel to perform tests, such as pure-tone audiometry, immittance measurements, otoacoustic emissions (OAEs), and auditory brainstem responses (ABRs), which are typically administered on-site [3]. Given that audiology services are an integral part of providing hearing healthcare to the Mauritian population, it is important to be aware of the current status of these services, which dually-qualified speech therapists and audiologists typically provide in the public healthcare sector of Mauritius.

A few studies worldwide have explored the barriers and facilitators in providing patients with hearing healthcare services. Zuriekat *et al.* [4] conducted semi-structured interviews with 25 audiologists in the United Kingdom. Audiologists reported limited resources and funding and also felt under-equipped to provide effective support to patients with HL. According to the outcomes of the study, audiologists can be assisted through service-level support, such as developing resources, funding, and training. In Australia, Ekberg *et al.* [5] reported a lack of knowledge, insufficient skills, limited resources, and insufficient training as the main barriers to overcome when providing intervention programs to allow audiologists to implement family-centered care in their daily practice. Naidoo and Khan's [6] study conducted in South Africa reported that the main barriers are the lack of resources in terms of staff and equipment, poor follow-up rates, limited knowledge and education, poor socio-economic status, and limited practicality of the guidelines relating to early hearing detection and intervention services. The implication is that more contextually relevant and practical guidelines should be implemented. Conversely, the authors recommended the development of task teams, creating improved communication networks for collaboration, further improving healthcare professionals' training, and increasing resources for facilitating early hearing detection and intervention services.

To our knowledge, no national study has, to date, focused on the delivery of an audiology service model according to the perspectives of audiologists in Mauritius' public healthcare sector. To establish the current status of implementing an audiology service model, it is essential to start at the ground level. This involves identifying the barriers and facilitators of such a model.

This study's objective is to explore the barriers to and facilitators of implementing an audiology service delivery model from the perspectives of audiologists in Mauritius' public healthcare sector. Such an awareness could enhance the understanding of the current issues of implementing an audiology service delivery model, yielding valuable insights for improving audiology services.

## 2. Materials and Methods

### 2.1. Study Design

This study adopted an exploratory, descriptive, qualitative

research methodology [7]. Semi-structured interviews were considered the best method to obtain information on the barriers to and facilitators of implementing an audiology service delivery model.

### 2.2. Participants

Convenience sampling was used as an all-inclusive criterion to select the audiologists practicing in Mauritius' public healthcare sector to participate in the study [8]. Participants had to be employed by the Ministry of Health and Wellness (MoHW), be proficient in English, and be willing to sign the consent form for inclusion in the study.

### 2.3. Ethical Considerations

This study was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2013, to ensure that the participants' rights were protected and that they were treated with respect. It was approved by Mauritius' MOHW and the Research Ethics Committee of the Faculty of Humanities of South Africa's University of Pretoria [HUM004/0921]. Participants' confidentiality was maintained throughout the study, and their written consent was obtained prior to the interviews.

### 2.4. Data Collection Tool

Detailed information was collected through one-on-one semi-structured telephonic interviews. General open-ended questions were used during these interviews, enabling the researcher to collect rich, contextually-relevant data [7]. The questions covered the audiology units' structure [9]; confidence in administering hearing tests [10]; protocols and guidelines [11]; appointments of patients [12]; access to technological facilities [1]; and experiences communicating to patients [9]. An interview guide was used to ensure thoroughness and consistency across interviews (see Appendix I for the full interview guide). Before the interviews, the participants were required to complete a short biographical online survey using Google Forms. The survey gathered demographic information and work details, including audiological background, experience, and the hospital at which the audiologists worked (see Appendix II for the survey questions). A pilot study was also conducted with an audiologist before the commencement of the current study to ensure that the interview questions were appropriate. The audiologist was excluded from the main study and subsequent analyses. The pilot study results indicated the need to simplify some questions, which were accordingly modified.

### 2.5. Data Collection Procedure

The researcher contacted the head of the speech therapy audiology services of Mauritius' public healthcare sector to obtain permission to conduct the study and for participants' details to be shared with the researcher. Subsequently, the researcher sent the information sheet, the consent form, the interview guidelines, as well as the link to the self-administered demographical online survey via email. On

the day of the telephonic interviews, the researcher interviews in a quiet and accessible space to avoid interruptions for approximately 20–30 minutes. During the interviews, the researcher used additional cues, such as follow-up prompts when needed [7]. As recording the interviews was not permitted (reasons unspecified), each interview was scribed and transcribed with the help of a colleague, and the transcriptions were then compared to ensure trustworthiness. Participants reviewed and verified transcribed interviews to check the accuracy of the transcripts and to ensure credibility [13].

## 2.6. Data Analysis

Individual transcripts were rechecked verbatim by the statistician, moved onto an Excel spreadsheet, and then imported to MAXDQA version 10. All the transcripts were analyzed via inductive thematic analysis [14], that is, the bottom-up approach, a method for identifying, analyzing, and reporting common themes to ensure rich and detailed data.

## 2.7. Demographics

The four participants were female audiologists employed in the public health sector of Mauritius (Table 1). Two (50%) had five to nine years of practice, one had less than five years, and one had 10 years of practical experience. Regarding educational qualifications, two (50%) held an undergraduate degree, whereas two had a master's degree.

**Table 1.** Summary of participant demographics.

Variables	Characteristics	Frequency
Sex	Female	4
Type of clinician	Speech Therapist and Audiologist	4
Number of years of practice	Less than 5	1
	5 – 9	2
	At least 10	1
Highest level of education	Undergraduate degree	2
	Master's degree	2

## 3. Results

Table 2 shows the main themes and subthemes identified in this study.

**Table 2.** Emergent themes from interview responses.

Themes	Subthemes
Infrastructure and resources	Human resources
	Clinical resources
	Audiological settings
Knowledge	Skills in administering tests
	Further training
Protocol and guidelines	Audiological norms
	Referral pathways
Appointments	Waiting list
Technology	Information systems
	Technological devices
Communication	Explanation of results
	Communication strategies

### 3.1. Resources and Infrastructure Theme

The participants focused on the theme of resources and infrastructure and identified three subthemes: (1) human resources, (2) clinical resources, and (3) settings of the audiological unit.

#### 3.1.1. Human Resources

Participants reported feeling adequately supported by the availability of speech and hearing assistants. Speech and hearing assistants are available daily to assist audiologists with the audiology unit's caseload of patients.

*The bulk of clinical staff, including speech and hearing assistants, makes it possible to allocate enough professionals to the unit. I feel it is an advantage that more staff have been recruited, and the unit keeps growing (Participant 3).*

Another participant commented on different staff members doing different work.

*There is efficient and smooth teamwork when we, audiologists and the speech and hearing assistants share work, which allows for good patient care and proper management (Participant 1).*

Another participant compared the staff turnover in the previous years.

*Well, if we compare our current clinical staff strength with what it was in previous years. A few years ago, we were working with skeleton staff, but now we have a reasonable size of staff (Participant 4).*

All participants agreed on the quality of administrative support that assisted them and enhanced their clinical work. They also highlighted the challenges encountered when their colleagues took leave, which, in their opinion, affected the provision of services.

*Oh, having administrative staff who are responsible for the paperwork on a daily basis is such an advantage. It makes such a difference, as it allows me to concentrate on the clinical load (Participant 3).*

*The records officer handles filing of patients' reports, and channels patients to their appointments, which is helpful, when there are many patients (Participant 1).*

*We do need more clinical staff, as in our absence, there may not be another audiologist in the unit (Participant 2).*

#### 3.1.2. Clinical Resources

Participants described their experiences of using the recently procured audiological equipment, which was reported as being adequate, functional, and well-calibrated to meet the needs of patients, as illustrated by the quotes below.

*We have diagnostic equipment, tympanometers, acoustic reflexes, ABRs, and OAEs, that allow a battery of tests. We have the latest equipment, that are well maintained and calibrated annually (Participant 3).*

One participant reported that the equipment is especially ideal for detecting HL in newborns.

*We are self-sufficient, as we have a variety of screening and diagnostic equipment. Now, we have wide absorbance, both transient evoked and distortion product OAEs, and*

*automated ABRs (AABRs), which is helpful for newborns with congenital HL (Participant 2).*

One participant reported that equipment for vestibular testing was somewhat lacking.

*There is no testing done for vestibular and balance disorders. While we have equipment for vestibular evoked myogenic potential testing, we do not have electronystagmography/videonystagmography (Participant 1).*

### 3.1.3. Audiological Settings

Participants described their experiences conducting various hearing assessments in a sound-treated environment. They had varying responses to questions regarding the standard of the sound-treated facilities across the public healthcare sector's audiology units.

*Look, the sound-treated room is not like abroad. Here, especially for patients with normal hearing, it may be tricky (Participant 3).*

*The sound-treated units are okay for hard of hearing or presbycusis patients, and, our units are being renovated with acoustic tiles and doors (Participant 2).*

*The audiology units are sound-treated; I do think that it may be ideal (Participant 4).*

### 3.2. Knowledge

The participants discussed their level of confidence in administering tests and identified the areas for further training. Two subthemes were identified:

#### 3.2.1. Skills in Administering Tests

Participants reported feeling confident conducting subjective hearing tests.

*Well, I can do basic tests, like pure tone audiometry and tympanometry, that we do on an everyday basis (Participant 4).*

However, they added that they lacked sufficient skills to conduct objective hearing tests.

*For some tests like ABRs, I do not feel 100% confident. I mean, while I know its theory, I definitely do not have enough hands-on experience (Participant 3).*

Another participant commented on the theoretical knowledge gathered during training but expressed concern about skills in carrying out evoked potential testing.

*I definitely have good theoretical knowledge that allows me to administer routine tests, but not electrophysiological testing (Participant 1).*

#### 3.2.2. Further Training

Participants unanimously emphasized on the importance of professional development training and felt that it was vital for good service provision.

*I have to say, that especially for neurodiagnostic tests and testing dizzy patients, I need to attend workshops (Participant 4).*

The need for training was further emphasized by participants, as indicated below.

*More training should be provided in electrophysiological*

*tests, especially for vestibular disorders (Participant 1).*

*I would definitely welcome a refresher on interpreting central auditory processing disorders (Participant 3).*

One of the participants discussed how further training in identified areas could have a positive impact on the ongoing development of clinical skills, and also increase the scope of practice.

*If we get additional training on evoked potentials and balance testing, we will learn more, and be able to do more, and broaden our scope of practice as the equipment is there, right? (Participant 2).*

### 3.3. Protocol and Guidelines

Different approaches were outlined regarding protocol and guidelines when interpreting hearing tests, as well as the referral pathways when patients are sent to the audiology unit for hearing tests. The analysis indicated two subthemes:

#### 3.3.1. Audiological Norms

Participants discussed the topic of adhering to clinical norms and, overall, a diversity of practice was revealed.

*You see, we all have different schools of thought, as we have been trained in different countries, but we follow international guidelines. We do not just do what we think is right (Participant 4).*

A participant spoke of a shortage of guidelines adapted to the Mauritian context.

*I wish we had our own set of protocols adapted to our population (Participant 1).*

Another participant argued that the lack of consistent norms was an issue, as it reflected non-standardization.

*There was a time when I was told to follow the WHO guidelines, but now, it is no more the case. I feel uniformity in norms is lacking (Participant 2).*

#### 3.3.2. Referral Pathways

A participant emphasized that the referral pathways currently in place were straightforward.

*We get referrals from doctors, so medical aspects are taken into consideration, and the pathway is smooth. (e.g., If wax has to be removed, it is taken care of, and patients with ear discharge are given droplets) (Participant 1).*

Another participant was worried about receiving fewer referrals from general practitioners (GPs) than ENT specialists and believed it would hinder the provision of effective services by delaying the timeline for individuals who need them.

*As you know, we mostly accept referrals for audiological tests from specialists rather than GPs, but even GPs are doctors, right? Hence, should we not accept more referrals from GPs? (Participant 3).*

### 3.4. Appointments

Generally, the participants commented on the time patients had to wait before obtaining an appointment. Notably, one subtheme emerged: *Waiting list*.

On the whole, the waiting list was perceived to be reasonable.

*I think the waiting list is fair. Look, some patients need to wait two to three weeks to get an appointment for a hearing test, but it is satisfactory for me (Participant 4).*

One participant pointed out the implications of having a waiting list that is not too long for timely service provision.

*There is a gap between the time when patients are first seen by the doctor, and seen for their hearing test, which creates a problem, as patients complain about having to wait for treatment (Participant 1).*

Most participants agreed that even if the waiting list is long, they always strive to accommodate patients who must be seen urgently, as illustrated by the quotes below.

*We do our best to accommodate patients; more so, when they are awaiting surgery by ENT specialists (Participant 2).*

*One thing I know is, that even if I do have a waiting list, if a doctor calls for scheduling an appointment, I never refuse (Participant 3).*

### 3.5. Technology

Participants described the technology available in the unit, and two subthemes emerged:

#### 3.5.1. Information Systems

Participants reported having access to data through good internet connectivity, with high bandwidth and stable power supply, at the hospital.

*We have access to good internet connectivity; even our printers are connected to our laptops through internet (Participant 2).*

*We have a separate high-speed Wi-Fi connection for our unit (Participant 4).*

*Oh! we do have internet and the information technology unit is there to help us, in case of problems (Participant 3).*

#### 3.5.2. Technological Devices

Concerning technology, the participants acknowledged that, overall, they have sufficient technological resources available to them to perform their duties.

*We have a wide variety of technological access. It is also fair to say, that all clinical equipment come from the supplier, with their own personal laptop (Participant 4).*

*We have laptops, personal computers, and printers. Our computers are updated with anti-virus (Participant 3).*

### 3.6. Communication

Participants described their experiences in communicating with patients. Two subthemes were identified:

#### 3.6.1. Explanation of Test Results

Participants mostly encountered positive experiences and considered counselling patients after carrying out the hearing tests as being always fruitful.

*I can recall mostly good experiences when giving simple instructions and explaining test results in layman's terms (Participant 1).*

*I like to counsel patients on how the test results may impact*

*their daily life, as that is their main concern (Participant 3). If there is anything I cannot counsel on, I definitely redirect patients to their doctors, and tell them that their doctors will explain in detail (Participant 2).*

#### 3.6.2. Use of Communication Strategies

Participants felt that being unable to implement effective communication strategies limited their ability to provide accurate instructions to patients, which in turn affected their ability to establish effective relationships with patients before beginning the audiological test.

*Sometimes patients who are really hard of hearing, either do not wear their hearing aids, or have old batteries in them. So, making myself heard or understood by such patients is sometimes tricky (Participant 3).*

Another participant added to this sentiment by stating that using face masks impacted communication skills.

*Look, we still have to wear masks every time, and that is not always practical, especially whilst communicating with patients with hearing difficulties (Participant 4).*

*Many patients have sometimes told me that they cannot lip read because I am wearing a face mask (Participant 4).*

*I tend to speak slowly and over-exaggerate my speech movements; so, patients understand (Participant 2).*

## 4. Discussion

Understanding the barriers to and facilitators of implementing an audiology service delivery model from the perspectives of audiologists can provide valuable information to the MOHW. This information can help ensure the provision of adequate hearing healthcare services to the Mauritian population.

Among lower-middle-income countries, 76% have fewer than one audiologist per million of the population [1]. Capacity versus demand remains the main challenge in providing hearing healthcare services in South Africa's public healthcare sector [15], where only 22% of qualified speech therapists and audiologists are employed [16]. Mauritius' public healthcare sector [17] currently has nine funded posts for audiologists and 18 posts for speech and hearing assistants for servicing a population of 1.274 million [18]. Speech and hearing assistants are mid-level workers who have completed a one-year certificate course in speech and hearing therapy approved by the MOHW [19]. Among other duties, their scope of practice includes conducting pure tone audiometry on patients of all ages, immittance testing under supervision, preparing audiological equipment, and recording the personal data of patients [20]. Their role in Mauritius' public healthcare sector embodies the concept of task-shifting, which is an integral component of the internationally recommended service delivery model, aimed at increasing accessibility to detect and manage patients with HL [21].

A long waiting list for government-funded services can prohibit access to receiving timely specialized support [12]. In the current study, all the participants reported accommodating patients within two to three weeks. This not only demonstrates

the Mauritian population's increased access to hearing healthcare services but also highlights audiologists' professional ethics and duty of care.

Naturally, the shortage of human resources, especially audiologists, on particular days, owing to work absenteeism, was viewed as a challenge that could complicate service delivery. These comments were expected and align with recent findings that suggest that when audiological services are provided by dually-qualified speech therapists and audiologists, as in Mauritius, they may also have to address the needs of patients requiring speech, language, swallowing, hearing, and balance care [16]. In the Mauritian context, clerical officers in audiology units play a crucial role in administrative tasks, such as record-keeping. This support facilitates audiologists' ability to provide clinical care to patients.

The lack of hearing healthcare resources, such as high-frequency tympanometry, AABRs, and OAE screeners, is a known barrier that hinders the efficient delivery of hearing healthcare services in South Africa's public healthcare system [22]. According to the current study, such equipment is available in Mauritius' public healthcare sector owing to the financial resources dedicated to audiology services in the past year. Recently, the MOHW allocated a budget of approximately 10 million Mauritian rupees for the procurement of screening and diagnostic equipment [23], which might imply that Mauritius' healthcare is optimally equipped to initiate both screening and diagnostic audiological assessments to meet the audiological needs of its population, especially infants and newborns. The participants expressed interest in receiving additional training to improve their skills in administering objective audiological tests, as they felt that the equipment was being underutilized. With increased training and skills, they will be able to serve patients better. The participants also expressed a need for more training in vestibular testing. This highlights the importance of providing ongoing support and in-service learning to help audiologists to transition from theoretical to practical education.

Finally, a combination of high-frequency tympanometry, OAE screening, and ABR testing is required for the reliable diagnosis of infants younger than six months [24]. However, despite the availability of adequate audiological equipment in Mauritius' public healthcare sector, no legislation currently exists for the implementation of an early detection and intervention program. This calls for action by the MOHW to implement an early hearing detection and intervention program by introducing newborn hearing screening in its public healthcare sector.

It is crucial to regularly maintain and calibrate audiometric equipment according to specific guidelines, especially when diagnosing HL in children. Using sporadically calibrated audiometry equipment could lead to unreliable results, which can have negative implications for individuals, especially children, who come for hearing evaluations (Brown *et al.* 2019). The participants described their audiometric equipment as well-maintained and calibrated. This indicates that

Mauritius' public healthcare sector is currently adequately equipped to provide quality audiological services to its population. Comparatively, a recent study that conducted an online survey with audiologists and dually-qualified speech therapists-audiologists across South Africa reported that not all healthcare facilities have the required budgets for the calibration and maintenance of audiological equipment [26]. Findings regarding budgetary constraints for equipment maintenance are consistent with a previous national study on hearing healthcare conducted in South Africa, which revealed that audiological equipment was poorly maintained [22]. However, it can be argued that compared to South Africa's public healthcare sector, which experiences financial strain relating to equipment maintenance, the increased financial allocations to audiology departments in Mauritius enhance hearing healthcare delivery.

Furthermore, the participants in this study identified sound-treatment facilities as a challenging clinical setting for delivering audiological services when compared to international standards. Nonetheless, as satisfactory audiological consultations usually occur within closed, sound-treated rooms [27], these have been perceived by participants as adequate for the audiology units to render efficient services to the Mauritian population.

In this study, the differences in the norms adopted for screening and diagnostic testing became evident. Using up-to-date, evidence-based practice is vital to ensure that patients' audiological needs are appropriately met while promoting the standardization of care [11]. While the participants reported adhering to international protocols and guidelines, the lack of uniformity and standardization in audiology protocols and norms is concerning, as it can negatively impact clinical audiological practice and compromise the quality of patient care [15]. The varied practices seem to be ascribable to training-related reasons. The current findings indicate the importance of implementing norms and guidelines that align with internationally accepted practices to ensure uniform clinical practice and to gain international acceptance of research findings.

Adequate referral pathways are essential and must be streamlined to allow prompt detection and intervention of HL to maintain continuity of care [28]. The participants identified a collaborative approach between doctors and audiologists as integral to providing more holistic services. This may help reduce the burden on ENT specialists and the duration of referral and treatment pathways.

Many public sector hospitals in South Africa have limited information technology support and internet access [29] because of unreliable electric power supply [15], partly due to load-shedding, which refers to scheduled national electricity supply interruptions [30]. It was, therefore, encouraging to see that similar technological access challenges were not experienced in Mauritius. The availability of information, vast technological resources, as well as access to reliable internet and coverage potentially suggest the feasibility of a teleaudiology service in Mauritius' public healthcare sector, in line with the 2021 World Report on Hearing that has prioritized

telehealth to make hearing care more accessible [29, 1].

The South African context shows a significant mismatch between audiologists and the population they serve with regard to language, which creates a barrier to the delivery of effective hearing care services [31]. While this was not perceived to be the case in Mauritius, using masks was reported to significantly impact communication with patients, as the MOHW has enforced strict mask-wearing policies in all healthcare facilities. The wearing of face masks reduces visual cues [32] and lowers speech sound intensity and clarity, which could debilitate hearing-impaired individuals who rely on such cues [30]. Participants reported that when counselling patients regarding their results, they focused particularly on the functional impact of HL on their daily activities. These are positive findings, as they show audiologists' commitment to personalized and patient-centered care tailored to the patients' needs, especially because previous research showed that audiologists often neglected counselling patients during audiology appointments [4].

#### **4.1. Strengths and Limitations**

To our knowledge, this is the first national study to provide insight into the barriers to and facilitators in implementing an audiology service delivery model in the Mauritius' public healthcare sector, where such data are scarce. Moreover, the results can be generalized to the larger Mauritian population because the study's sampling technique resulted in the selection of participants that are representative of audiologists employed in the public healthcare sector of Mauritius. However, this study was exploratory. It included only a small sample of audiologists and focused solely on their perceptions of the barriers to and facilitators of implementing an audiology service delivery model in the public sector of Mauritius. As audiology units are also serviced by speech and hearing assistants, considering their perspectives could have increased this study's response rate. Participant bias should also be accounted for, as responses could have been influenced by the degree of connection with the researcher.

#### **4.2. Recommendations**

This study's findings suggest several recommendations to enhance the provision of audiology services in Mauritius. As it was conducted in the public healthcare sector, where clinical services are mostly accessed, exploring how resources can be used to implement a sustainable program for early hearing detection and intervention is necessary. This can be established by formalizing and standardizing newborn hearing screening, which is the initial stage of any hearing detection and intervention program [33]. Task-sharing, which the public healthcare sectors of South Africa, Nigeria, and Zambia have successfully implemented for newborn hearing screening [34], could serve as an example for Mauritius' audiology units. They can similarly develop internal guidelines by referring to the JCIH's [24] guidelines for early HL detection, as well as interventions to standardize care for all patients, improving the sustainability of audiology services' provisions across the

Mauritius public healthcare sector. The audiology units of the public healthcare sector should also be according to international standards and specifications with regard to attenuation and noise levels. Additionally, it is recommended that the audiologists of the public healthcare sector follow ongoing training through workshops or continuing professional development courses to address the clinical needs of audiologists.

Finally, this study's findings can be used as evidence to alert its stakeholders and decision makers (e.g., MOHW) to improve the delivery of audiology services within the public healthcare sector so that the island of Mauritius can favorably render efficient services to its population, which needs such audiology services.

## **5. Conclusion**

The main themes which were identified during this study's findings were infrastructure and resources—human and clinical resources and audiological settings; knowledge—administering tests and further training; protocol and guidelines—audiological norms and referral pathways; appointments—waiting list; technology—information systems and technological devices, and communication—explanation of test results and communication strategies. Participants were aware of the various resources available for audiology services, but there were concerns regarding the implementation of standardized guidelines in audiology practice. The study's findings suggest that the public healthcare sector's sizeable availability of resources is conducive to early detection of and intervention in HL. It is recommended that changes are implemented to improve healthcare services to the Mauritian population by introducing an early hearing detection and intervention program consistent with international norms and guidelines endorsed by the JCIH [24]. This will enable prompt and timely diagnosis and management of HL, especially in infants [11]. Future studies should consider the perspectives of speech and hearing assistants regarding the barriers to and facilitators in implementing an audiology service delivery model in the Mauritius' public healthcare sector.

## **Data Availability**

The data that supports this study's findings are available on request from any of the authors.

## **Ethical Approval**

Ethical approval was obtained from both MoHW, Mauritius, and the Research Ethics Committee of Humanities, University of Pretoria, South Africa.

## **Informed Consent from Participants**

Written informed consent was obtained from all participants prior to conducting the interviews.

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## Conflicts of Interest

The authors have no potential conflicts of interest to disclose with respect to this study's research, authorship, and/or publication.

## Appendix

### Appendix I. Interview Guide

Barriers to and facilitators of implementing an audiology service delivery model in Mauritius' public healthcare sector.

*Objective:* To explore the barriers to and facilitators of implementing an audiology service delivery model from the perspectives of audiologists in Mauritius' public healthcare sector.

*Design and analysis:* Semi-structured telephonic interviews were conducted with four audiologists from the public healthcare sector in Mauritius. Data was transcribed verbatim, and inductive thematic analyses were used to identify themes and subthemes.

#### Main question

1: Tell me about the structure pertaining to the audiology units of the public healthcare sector and the resources that you have access to.

2: How confident do you feel in administering objective and subjective audiological tests on a daily basis?

3: What are your opinions based on the protocol and guidelines adhered to by audiologists?

4: What are your thoughts about patients' appointments when they come to seek audiology services?

5: What do you think about the overall access to technological facilities in the audiology units?

6: Describe your experiences communicating with patients who attend their hearing evaluations.

#### Optional probe questions

What types of resources are there in the unit? About the clinical and administrative staff?

What about the availability of audiological equipment that you use when assessing patients?

Any thoughts about the setting of the unit you are based in, in terms of attenuation of sounds from the outside?

What are the audiological tests that you conduct every day?

With children? With adults? How at ease do you feel conducting those tests?

Do you feel the need for any support in conducting those hearing assessments? If yes, what kind of support do you think would be beneficial?

Do you follow any particular audiology guidelines or norms when conducting hearing assessments?

How are patients referred to the audiology unit for their hearing assessments?

How long do patients have to wait to get an appointment following their referral? How do you feel about that?

Do you have access to a range of technology in your unit?

What are they? Are they beneficial to your unit? What about connection to the internet?

How do you relay the hearing test results to your patients? Do patients encounter any difficulties understanding hearing test results? In such cases, how do you help them in overcoming those difficulties?

### Appendix II Questionnaire

1. Type of clinician

- ☐ Audiologist ☐ Speech and Language Therapist  
☐ Speech Therapist and Audiologist

2. Gender

- ☐ Male ☐ Female

3. What is your practice setting? [Tick all that apply]

- ☐ Area Health Centre ☐ Community Health Centre ☐ Medi-clinic Hospital  
☐ Other (please specify): \_\_\_\_\_

3. For how long (years) have you been in practice?

- ☐ Less than 5 ☐ 5–9 ☐ 10 or more

4. In which hospital are you currently based?

- ☐ Jeetoo ☐ Dr. Bruno Cheong ☐ Jawaharlal Nehru  
☐ Sir Seewoosagur Ramgoolam National  
☐ Other (please specify): \_\_\_\_\_



5. What is your highest level of education?

☐ Undergraduate degree ☐ Master's degree

6. For how long have you been in practice?

☐ Less than 5 years ☐ 5-9 years

☐ Doctoral degree

☐ Other

☐ At least 10 years

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