

Hearing Health in Lesotho: An Investigation into Knowledge, Understanding and Attitude towards Hearing Loss

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Abstract This study investigated hearing health in Lesotho based on the knowledge, understanding and attitudes of Basotho people in tertiary institutions towards hearing loss and hearing aid users. The Health Belief Model framed the study. Data generation in the study was achieved through a mixed method approach using both a closed-ended structured questionnaire administered to 272 participants and a semi-structured interview with 6 respondents who were randomly selected from the 272 participants who responded to the closed-ended questionnaire. Data generated were analysed using descriptive (frequency count, simple percentage, mean and standard deviation), and inferential statistics (Chi-square) at $p < 0.05$. Also, a thematic analysis was used to analyse the transcribed semi-structured interviews. The findings showed that participants had a good understanding and knowledge of hearing health in relation to the implications of excessive noise and wax in the ear which may lead to hearing difficulties, as well as the need for ear checks at accredited ear clinics/centres; however, they still engage in risky hearing healthcare behaviours. Participants also had a higher negative attitude towards hearing loss as a condition but necessarily towards individuals with hearing loss. An association was identified between knowledge about hearing health and hearing in the study. Another

association was recorded between gender and attitude towards persons with hearing loss and hearing aid users. Appropriate recommendations were made with respect to the findings.

Keywords Hearing Health, Hearing Loss, Hearing Aid Users, Hearing Healthcare Centres

1. Introduction

Defects in various components of the ear can lead to what is referred to as hearing loss or hearing impairment. Hearing loss has been described as a condition that arises when an individual has extreme difficulty receiving and interpreting sound stimuli [1]. Hearing loss is a sensory impairment, and it is on a spectrum. In other words, hearing loss can range from mild to profound [2-4]. According to the WHO (2020), individuals with hearing loss are those who have difficulty in perceiving sound signals with intensities less than 25dB HL. Hearing loss can be partial or total; it can also be bilateral or unilateral [5-7]. Based on the forgoing descriptions, hearing loss is a 'hidden' disability that only becomes evident in

conversational situations that require the exchange of verbal cues.

People with hearing loss are found in every human settlement. Available estimates indicate that over 360 million persons are living with hearing loss globally, of whom about 136 million are from Africa [8]. Olusanya et al. [9] claim that about 6 in every 1,000 babies are born with congenital hearing loss in Africa. Further, in a 2021 report on hearing by the WHO, an estimated 39.9 million Africans have moderate to profound hearing loss. Lamentably, the population of Africans with hearing loss is projected to rise to about 332 million by the year 2050 [8]. Hence, there is a need for an adequate understanding of hearing loss, its implications and how to address its associated public health concerns that may arise from inadequate knowledge about hearing health. There are several factors that can influence health (hearing health) behaviour with regard to hearing loss [10]. In the examination of hearing health, studies of Saunders et al. [11] and Schulz et al. [10] had shown that assessing hearing health requires the use of a multifactorial lens. Hence, this current study will be anchored on the Health Belief Model (HBM) [12, 13] because it is a multifactorial framework that has capacity to explain and provide a clearer understanding of hearing health and associated attitudes towards hearing health and hearing health behaviors [10]. As asserted by Schulz et al. [10], HBM can be used to provide vivid understanding of ‘why’, ‘what’, and ‘when’ of the action of an individual that informs actions towards hearing health behavior and hearing healthcare. Anchoring this study on the assumption of the HBM is in line with past studies which have established that through the six associated constructs (perceived susceptibility, perceived severity; perceived benefits; perceived barriers; perceived self-efficacy, and cues to action) of HBM, HBM has predictive capacity to predict or explicate acceptance of (hearing) healthcare and recommendations [10, 11, 14, 15]. Therefore, this study being anchored on the framework of HBM, and the objective of this study was to investigate the knowledge, understanding and attitude towards persons with hearing loss and hearing aid users in Lesotho.

2. Literature Review

Various data on hearing loss within the Sub-Saharan African region show that it is more prevalent in this region than on other continents [3, 6]. Based on the available evidence, Sub-Saharan Africa may be described as an epicentre of hearing disability, with an over-representation of children among the identified population [6]. The negative effects associated with hearing loss and the lack of verbal communicative abilities are not only felt by persons with hearing loss but also by families, friends and members of the communities associated with the individuals with hearing disabilities [1, 3, 16]. Despite the effects associated

with hearing loss, it is also appalling that the knowledge and understanding of hearing loss is still vague, especially in Sub-Saharan Africa. Emerging evidence from Sub-Saharan Africa shows that the aetiology of hearing loss is diverse and multivariate [3, 4, 7, 16-23]. In their studies, Wonkam et al. [24] and Wonkam-Tingang et al. [23] note that environmental conditions, as well as diseases such as measles, meningitis, and/or ototoxicity remain major causative factors of hearing loss in several low- and middle-income countries.

A retrospective study conducted by Chiabi et al. [25] among some children in Bertoua, Cameroon, showed that severe cases of malaria led to serious hearing loss, and these cases were identified in the East Provincial Hospital of Bertoua. While Taha et al. [26] stated that about 30% of children within the Shebin El-Kom District of Egypt were diagnosed with hearing loss, Elbeltagy et al. [27] stressed that about 50% of the identified hearing loss cases were of genetic origin. Further, other related causes of Hearing loss in children identified by Elbeltagy et al. [27] include maternal conditions such as cytomegalovirus, German measles, premature birth, birth injuries, and ototoxic medication [28]. Earlier studies by Lebeko et al. [29] state that about 30–50% of cases of childhood hearing loss within sub-Saharan Africa are caused by genetic factors. Some other studies, for instance those by Joubert et al. [28]; Osisanya et al. [30]; and Osisanya et al. [31] posit that causes of hearing loss in recent times have extended beyond biological causes as more indications of hearing loss are currently being traced to environmental noise pollution. Osisanya et al. [30] and Rizwan et al. [32] noted that the excessive use of mobile phones on the highest volume, and the cacophony of traffic and other noises from construction sites and marketplaces are factors responsible for Noise-Induced Hearing Loss (NIHL). In addition, excessive loud noise above normal thresholds from home appliances such as television and radio sets can also cause NIHL. NIHL may result from sound stimuli exceeding 85dB [33]. Although, hearing loss is a preventable condition [1, 3, 31], people’s understanding of hearing health is questionable.

Kimball et al. [34] remark that people have control over numerous factors that may result in hearing difficulties. However, the information available to individuals about lifestyle and health may be limited or inadequate. Kimball et al. [34] thus submit that people should be informed about the care of hearing organs. According to the American Speech-Language-Hearing Association [35] in their report about the attitudes and actions of adults towards hearing health in the United States, a large population of Americans are aware of the implications and importance of maintaining adequate hearing health and the impact of untreated hearing loss on academic, social and employability potentials. Despite this, the report of the ASHA [35] revealed that most Americans seem to be careless about hearing health as they had not presented themselves for hearing tests in the five years prior to the

study. Regardless of the perceived adequacy in the knowledge about hearing health, the ASHA [35] note that about 40% of their respondents were only ready to present themselves for a hearing evaluation once their hearing difficulty was “severe”. The report revealed that most Americans failed to take precautions about their hearing, because barriers to early presentation for hearing assessment and treatment of hearing loss include financial barriers and challenges relating to health insurance.

Risk behaviours towards hearing health are not culture or gender specific. In other words, hearing health risk behaviours seem to be permeated across structures of human settlements [33, 36]. According to Keppler et al. [37], carefree attitudes towards excessive occupational and recreational noise exposure are alarming, and this submission by Keppler et al. [37] may not be unconnected to the rise in the estimated populations of persons with hearing loss in Sub-Saharan Africa [8, 27, 29]. This perceived rise in the population of hearing impaired is coupled with an increase in the awareness and usage of hearing aids among persons newly diagnosed with hearing loss on the continent of Africa [4, 8, 27, 38]. However, the percentage of usage among those already fitted with hearing aids is low [39, 40]. Studies have shown that the effective usage of hearing aids is impacted by several factors. For instance, Aravinda et al. [41]; Goh et al. [42]; and Kochkin [43] found that persons with hearing loss fail to use hearing aids judiciously, not only because of financial implications, but also because there is a stigma associated with hearing aid usage. In fact, this stigma was the main reason. According to Goh et al. [42], persons with hearing loss are not motivated to wear their hearing aids because they feel it makes them look as though they are disabled; especially when such hearing aids are noticeable. In the study by Meister et al. [44], the willingness to use hearing aids, regardless of anything, was significantly associated with stigmatization, personality traits, and the self-perceived severity of the hearing loss. An earlier study by Meister et al. [45] indicated that a 55% variance in patients’ self-rated hearing ability, expectations of improved hearing health and quality of life, and stigmatization accounted for willingness to use hearing aids effectively. It is possible, however, that willingness to use hearing aids may also be based on other variables such as the age and gender of the user [43, 46].

Based on the results obtained by Brooks and Hallam [47], a logistic regression analysis of age, gender and severities of hearing loss did not significantly correlate with or predict the level of usage or satisfaction with hearing aid usage among 135 patients referred to the Audiological Rehabilitation Unit at Whittington Hospital, Manchester, UK. On the other hand, Hickson et al. [46] did note that the patients who received positive support from significant others were more likely to utilize hearing aids. In other words, a positive attitude towards hearing aid users improves their confidence to wear and use their hearing aids in public. A very recent study by Aravinda et al. [41]

established variability of the stigma associated with hearing aid usage among 425 Indians. Aravinda et al. [41] admitted that such variation is influenced by socio-demographical factors which include age groups, gender, geographical location, and association with the non-hearing-impaired population.

3. Current Study

Lesotho is a country landlocked and bordered only by South Africa. With a population of about 2.5 million [48], Lesotho is known for her mountainous topography. According to the WHO [8], the ratio of doctors to the population in the country is about 0.9/10,000 which is far less than the WHO AFRO regional average of 2.6 and 12.0 per 10,000. Asamani et al. [49] stated that as of 2020, the country had 20,942 active health workers across 18 health occupations. The foregoing implies that medical professionals in the country constitute 1% of the population and they serve the population of about 2.5 million. The shortage of medical professionals and the dispersed nature of settlements due to mountainous terrain make access to adequate and timely healthcare services more difficult in Lesotho. Hence, there are rapidly declining health indices in Lesotho and particularly for those with hearing loss.

Regrettably, the country has an estimated population of around 4,500 people living with hearing loss [50]. Unfortunately, there is also a great tendency for a rapid increase in the population of persons with hearing loss in the country because of risky hearing health behaviours due to limited knowledge and understanding of hearing healthcare. It is very disheartening that, given the fragility of the country’s health sector and the perceived tendency for increased hearing loss, there is no available evidence of the level of hearing health knowledge among the general population or of the attitudes towards hearing aid users in the country. Based on the foregoing, this current study bridges the identified research gap by investigating the knowledge, understanding and attitude towards persons with hearing loss and hearing aid users in Lesotho. It is our belief that the outcome of this study will influence policy actions that will activate the need for the development of hearing healthcare policy in Lesotho. Such policy would inform responsive action to training and practices of hearing healthcare and services to the Basotho.

The current study is anchored on the principles of the Health Belief Model (HBM) which assumes that health (hearing health)-related behaviour is a function of the interaction of various factors: perceived-susceptibility, severity, benefits, barriers, cues to action, and self-efficacy [51, 52]. According to Snetselaar and Delahanty [52], the HBM is a psychological model that is used to provide an explanation and predict health behaviours through the lens of the attitudes and beliefs of individuals. According to Siddiqui et al. [51], the HBM is descriptive/predictive and

does not suggest a strategy for changing health-related actions. Therefore, two research questions were raised for this study and they are:

- What is the state of respondents' understanding and knowledge of hearing health as well as their attitude towards individuals with hearing loss?
- Is there any association between sociodemographic variables, knowledge about hearing health and respondents' attitude towards persons with hearing loss?

4. Method and Materials

Study design and setting: This study adopted a descriptive-mixed method survey research design among 272 students registered at the only publicly funded University in Lesotho. It was the Authors who believe participants of this study are representative samples of people from the 10 districts of Lesotho. Hence, we assumed that they have adequate information about the state of hearing healthcare and societal disposition toward individuals with hearing loss in their country homes. Data collection in this current study was achieved through the quantitative and qualitative lenses. According to a mixed-method approach, it helps to integrate and juxtapose findings from both quantitative and qualitative data [53, 54]. Further, we adopted the use of mixed method basically because it provided us with ample opportunity to offer expansive evidence on the state and complexities of the understanding, knowledge and attitude of the Basotho towards hearing health and hearing loss in Lesotho.

Sampling techniques and participants: A purposive sampling technique was used to identify and select the publicly funded post-secondary education institution in Lesotho. The researchers further adopted a convenient sampling procedure (non-probability sampling) [55] to select 272 students (males; $n = 40.4\%$; females, $n = 59.6\%$) from the institution. The respondents in this study were aged 20 years and above ($\bar{X} = 30.15$; Std. dev. (σ) = 6.97). As shown in Table 1, a total of 111 (47.8%) respondents (students) were drawn from the Faculty of Education while the least represented faculty was the Faculty of Humanities with just 8.5% representation. The majority of the study's respondents were on a Bachelor's degree programme ($n = 144$; 52.9%) at the time of data collection between May 10 and June 30, 2022. A total of 185 (68.0%) respondents had no relations or friends with hearing loss; 38 (14.0%) the respondents had never heard of an Audiologist prior to data collection; and 145 (53.3%) respondents indicated that they had come across the word 'Audiologist' on the Internet. In addition, to ensure credibility and focused generalizability, we adopted a homogenous convenience sampling procedure which was employed to sample six respondents who were recruited for a semi-structured interview. The six respondents were sampled from the 272 students who responded to the structured research

questionnaire. Each of the sampled respondents belongs to one of the six Faculties of the University from which the 272 students were drawn.

Table 1. Socio-demographics of the study respondents

	N (%)	Mean \pm s.d
Gender		
Male	110 (40.4)	
Female	162 (59.6)	
Age range of the respondents (years)		
20-30	130 (47.8)	
31-40	102 (37.5)	30.15 \pm 6.97
> 41	40 (14.7)	
Faculty		
Education	111 (40.8)	
Agriculture	58 (21.3)	
Health Sciences	30 (11.0)	
Humanities	23 (8.5)	
Law	24 (8.8)	
Science and Technology	26 (9.6)	
Program registered for		
Diploma	37 (13.6)	
Bachelor's degree	144 (52.9)	
Honours degree	42 (15.4)	
Master's degree and above	42 (18.0)	
Experience of hearing loss by family members/friends		
Yes	87 (32.0)	
No	185 (68.0)	
Heard about an Audiologist		
Yes	210 (77.2)	
No	38 (14.0)	
Not sure	24 (8.8)	
Source of knowledge about an Audiologist		
Television	7 (2.6)	
Internet	145 (53.3)	
Health workers	63 (23.2)	
Families and friends	57 (21.0)	

Measures: Data were collected in this study using a structured closed-ended questionnaire and semi-structured interview guide. The structured closed-ended questionnaire comprised four sections (A-D). Section A was used to collect the socio-demographic information from the respondents (shown in Table 1). Section B was

used to elicit information about the respondents' understanding about hearing health. Section C assessed the knowledge of the respondents about hearing loss; and Section D was used to determine their attitudes towards individuals with hearing loss. The items in Sections B to D were generated (adapted and adopted) from past related studies such as those by Alshehri et al. [56]; Aravinda et al. [41]; Elbeltagy et al. [27]; and Joubert et al. [28] respectively. Section B of the structured closed-ended questionnaire used for data collection was designed so that the respondents had multiple options to choose from, while Sections C and D were designed in a three response format of 'Yes,' 'No,' and 'Not sure'. Furthermore, a semi-structured interview was also conducted for the purpose of collecting qualitative data. Respondents sampled for the semi-structured interview were coded as P1 to P6. The respondents identified were interviewed based on their understanding of hearing health, knowledge of hearing loss and their attitude towards individuals with hearing loss. The aim of the interview was to further confirm the responses provided in the closed-ended structured questionnaire and to inquire about issues that were not captured on the questionnaire. The use of mixed methods in this study was in line with the principles of methodological triangulation espoused by Mertens and Hesse-Biber [57]; and Olsen [58].

Validity of the instrument: Face and content validity of the research instrument was achieved. Two academics and researchers from humanities and health sciences respectively assessed the instrument for appropriateness.

Procedure for data collection: Data collection for this

study was achieved using both a **Google form** and a paper-pencil questionnaire format. The **link to the e-questionnaire** on Google was shared with all students via the students' various WhatsApp platforms. The link to the questionnaire was also shared on the institutional **Learning Management System** platform for the attention of all students. There was a low response rate from the students, so the researchers distributed hardcopies of the questionnaire and a total of 272 students responded. The paper-pencil approach produced rapid results and a response rate of 74%. Two research assistants assisted with the distribution of the hardcopies of the questionnaire among the students. A semi-structured interview was also conducted with six of the respondents using an interview guide. This was done to capture any additional information which was perhaps not captured using the close-ended questionnaire. In other words, the semi-structured interview was grounded on the issues addressed in the structured questionnaire. The interview sessions were recorded using voice recorders.

Data Analysis: Descriptive statistics of frequency count, simple percentages, measures of central tendencies, and inferential statistics (the Chi Square (χ^2) at a $p < 0.05$ level of significance) were used to analyse the quantitative data collected. The audio recorded in-depth interviews were transcribed by an independent research assistant. Another research assistant then checked the transcription for accuracy independently using the notes taken during the interview process. The transcribed data collected were then thematically analysed using an iterative process [59] based on the interpretivist paradigm [60]. The thematic analysis adopted the six interactive phases (See figure 1).

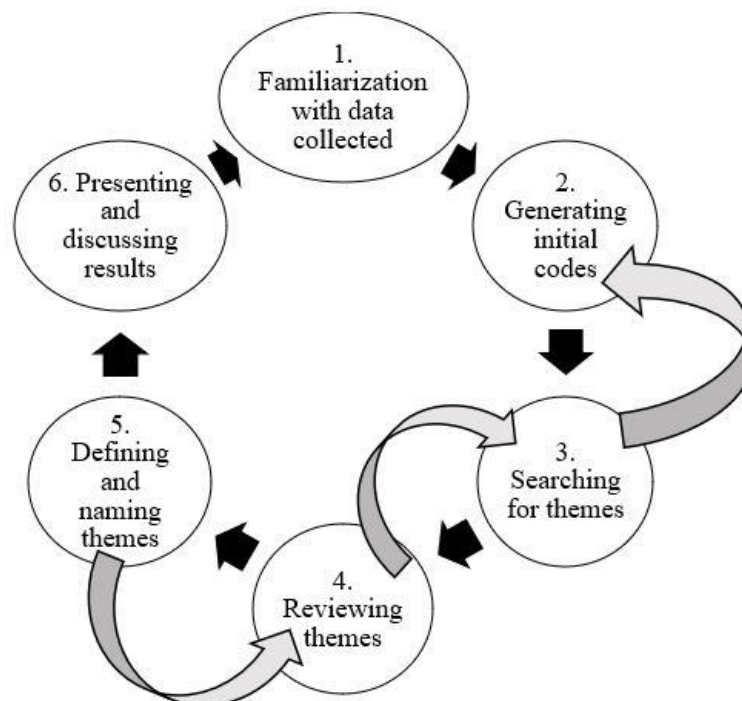


Figure 1. Six interactive processes of thematic analysis

Ethical Consideration: The respondents provided their informed consent to participate in the study, and this was provided voluntarily. The study was approved by the institution's Institutional Review Board before allowing the **link to the e-questionnaire** to be shared on the **Learning Management System** platform of the institution. All ethics of social sciences and humanities research espoused by the *Declaration of Helsinki* were strictly adhered to.

5. Results

In our quest to provide an adequate response to research question one, we first inquired about their understanding with regard to hearing health-related practices. As shown in Table 2, the study respondents had a good understanding of hearing health, as 53.7% agreed that hearing loss could arise as result of infection to the ear. A total of 17.3% and 15.5% respectively believed that excessive noise and wax in the ear could lead to hearing difficulties. The majority (82.4%) of the respondents believed that it was important to have regular ear checks at accredited ear clinics/centres. However, despite the respondents' understanding of the importance of ear checks/tests in accredited clinic/centres, only 118 (43.4%) of the respondents stated that they frequently cleaned their ears themselves using cotton buds (ear buds) (63.6%), matchsticks (23.5%), a wet cloth (6.6%), or other materials (4.0%). Only six of the study's participants (2.2%) indicated that they did not clean their ears by themselves. Table 2 shows that the participants had a good understanding of hearing health. However, they still engaged in risky hearing health behaviours. Selected participants were thus probed further using the semi-structured interview and asked why Basotho¹ people engaged in perceived risky hearing health behaviours. Below are two excerpts:

P4 (male) from the Faculty of Health Sciences stated:

I think it's a function of understanding hearing health and/or perhaps available information on how and where to get immediate and low-cost hearing healthcare.

P1 (female) from the Faculty of Agriculture stated:

Lesotho has many dispersed settlements, especially in the rural areas. I think access to existing healthcare facilities has contributed to regular use of localized/traditional means of ear care.

As revealed in the excerpts above, Basotho people engaged in behaviours that had potential risks to their hearing health because they lacked the required information about international best practices for ear care. Although some could have substantial hearing healthcare information, the distance to- and the associated inflated costs of seeking hearing healthcare in approved ear care

centres could be a burden. Table 3 reveals the responses of the 272 respondents about their knowledge of hearing health in Lesotho. The responses were ranked according to the calculated means and standard deviations. As revealed in the Table, the responses to item number seven ranked first. Unfortunately, a total of 120 respondents (44.1% of the study population) were not sure about whether or not a hearing test could only be conducted by an Audiologist.

Table 2. Respondents' understanding of hearing health

	N (%)
What do you think is the cause of hearing difficulties?	
Ear infection	146 (53.7)
Noise (e.g., MP3 players, music)	47 (17.3)
Some medications (e.g., for TB, HIV, Malaria, etc.)	3 (1.1)
Family member with hearing loss	23 (8.5)
Too much of wax in the ear	42 (15.4)
Others	11 (4.0)
How important is it to have your ears check/tested in accredited clinics/centres?	
Greatly important	224 (82.4)
Considerably important	11 (4.0)
Important	37 (13.6)
How often do you clean your ears by yourself?	
Hardly ever	27 (9.9)
Occasionally	48 (17.6)
Sometimes	42 (15.4)
Frequently	118 (43.4)
Almost always	37 (13.6)
What do you use to clean your ears?	
Cotton buds (ear buds)	173 (63.6)
Matchsticks	64 (23.5)
Wet cloth	18 (6.6)
Nothing	6 (2.2)
Other	11 (4.0)

¹ Basotho people are citizens of Lesotho with a unique culture.

Table 3. Knowledge about hearing health among the respondents

S/N	Item	Yes N (%)	No N (%)	Not sure N (%)	Mean ± s.d	Ranking
1	Hearing loss can occur at any time in one’s life.	240 (88.2)	0 (0.0)	32 (11.8)	1.24 ± .65	13 th
2	Hearing loss cannot be treated.	234 (86.4)	3 (1.1)	34 (12.5)	1.26 ± .67	12 th
3	Listening to music for more than 3 hours a day using earphones may cause permanent hearing loss.	58 (21.3)	168 (61.8)	46 (16.9)	1.97 ± .64	6 th
4	Hearing loss is age-specific.	77 (28.3)	126 (46.3)	69 (25.4)	1.97 ± .73	5 th
5	Individuals with hearing loss are very dumb.	81 (29.8)	96 (35.3)	95 (34.9)	2.05 ± .80	3 rd
6	Getting treatment for hearing loss is practically impossible in Lesotho.	29 (10.7)	232 (85.3)	11 (4.0)	1.93 ± .39	7 th
7	Only an Audiologist can conduct a hearing test.	82 (30.1)	70 (25.7)	120 (44.1)	2.14 ± .85	1 st
8	Drug abuse is associated with hearing loss.	148 (54.4)	13 (4.8)	111 (40.8)	1.86 ± .97	8 th
9	Only babies and children should be encouraged to get a hearing test.	91 (33.5)	85 (31.3)	96 (35.3)	2.01 ± .83	4 th
10	It is possible to diagnose hearing loss in an infant shortly after birth.	233 (85.7)	16 (5.9)	23 (8.5)	2.06 ± .37	2 nd
11	Hearing loss may cause behavioural disorders and reduce learning outcomes.	156 (57.4)	22 (8.1)	94 (34.6)	1.77 ± .93	9 th
12	Slaps on the ear may lead to hearing loss.	248 (91.2)	4 (1.5)	20 (7.4)	1.16 ± .53	15 th
13	Excessive noise may cause hearing loss.	226 (83.1)	31 (11.4)	15 (5.5)	1.22 ± .53	14 th
14	Irritating perception of sound requires urgent medical advice and attention.	2 (0.7)	256 (94.1)	14 (5.1)	1.11 ± .45	16 th
15	Excessive use of earphones, Ipods, or headphones may lead to hearing loss in later years.	214 (78.7)	38 (14.0)	20 (7.4)	1.29 ± .59	11 th
16	Is it important to have your hearing tested?	11 (4.0)	224 (82.4)	37 (13.6)	1.31 ± .70	10 th

Very few respondents answered ‘no’ to item number ten, thus indicating that it was possible to diagnose hearing loss in infants shortly after birth. Item number five ranked third in the measure of knowledge about hearing health. This study found that the respondents only had vague knowledge about hearing loss/disability as 29.8% indicated ‘yes’; 35.3% indicated ‘no’; and 34.9% of the respondents were not sure if individuals with hearing loss were regarded as ‘dumb’.

Many of the respondents believed that it was possible to diagnose hearing loss in infants shortly after birth, and many believed that only babies and children should be encouraged to get a hearing test (see item number 9 which ranked 4th). It was assumed that their responses to item number nine were responsible for their belief that hearing loss was age-specific. Item number three ranked 5th while item number fourteen, which stated that irritating perceptions of sound required urgent medical advice and attention, ranked last (16th). The implications of the foregoing were that the participants had a fairly good knowledge of hearing health. However, despite the participants’ knowledge of the role of an Audiologist in

hearing healthcare, it was surprising that the participants did not believe that it was particularly important to seek relevant ear care and to have regular ear checks. We followed the questionnaire with six semi-structured interviews to understand their knowledge about accessing hearing healthcare.

P3 (female) from the Faculty of Humanities commented:

People believe irritation in the ear is not something that is serious. When such happens, people often use castor oil in their ear and block it with cotton wool. More so, it is difficult to get ear care centres because such centres are few in the country.

P5 (male) from the Faculty of Education remarked:

Yes, I know that it is good to have regular ear checks but how do you do that when there is no readily available centre for such? It is even rare to come across such professionals in some provinces of Lesotho.

The above excerpts indicated that despite the perceived knowledge of the participants about hearing health, a traditional healthcare belief system was still prevalent in

the country. This belief system was still predominantly in use, perhaps due to a lack of access to and availability of relevant hearing healthcare centres. Table 4 presents a ranking from 1st to 17th of agreement or otherwise to the items that were used to inquire about the attitude of the respondents towards individuals with hearing loss and hearing aid users. A total of 163 (59.9%) respondents felt that attitude towards individuals with hearing loss was not influenced by the size of the hearing aid worn. They thus believed that individuals with hearing should not address interventions for hearing loss using unconventional methods. The responses to items 5 and 15 seemed positive and they ranked 1st and 2nd respectively. Unfortunately, 55.9% of the respondents felt uncomfortable having someone close to them access and make use of a hearing aid (item 16, ranked 3rd). They even indicated their lack of readiness to make friends with hearing aid users (item 17, ranked 4th).

It seemed somewhat awkward that while some respondents favoured access to and the use of hearing aids (items 5 and 16), some respondents had reservations about active interaction and engagement with persons with hearing loss. The responses to items 2 and 3 ranked 17th and 16th respectively and they further revealed the negative

attitude and/or perception of some of the respondents towards individuals with hearing loss.

During the interview, P6 (male) from the Faculty of Law submitted:

I really don't have a problem interacting with people who are fitted with hearing aids. Although, I hardly see people use hearing aids, but I have met one lady using hearing aids. The only thing that I noticed about her was she could clearly hear me, but she was speaking too loud to me, and her speech was not that smooth.

Similarly, P1 (male) from the Faculty of Science and Technology stated:

Due to the high cost of hearing aids and difficulties one may encounter for recurrent servicing of the device, I will not encourage someone close to me to get a hearing aid. At least not with the present potential health-related challenges in the country.

Excerpts from the interviews with the participants showed that they did not have a negative attitude towards hearing aid users without cause. Their perceived attitude was informed by the implications of hearing aid usage with regard to maintenance.

Table 4. Ranking of respondents' attitudes towards individuals with hearing loss

S/N	Item	Yes N (%)	No N (%)	Not sure N (%)	Mean \pm s.d
1	I like to see people with hearing aids.	128 (47.1)	144 (52.9)	1.53 \pm .50	5 th
2	Users of hearing aids are difficult to interact with.	170 (62.5)	102 (37.5)	1.38 \pm .49	17 th
3	A hearing aid is helpful in making hearing easier.	151 (55.5)	121 (44.5)	1.45 \pm .50	16 th
4	Did you know that hearing aids are available in different styles?	142 (52.2)	130 (47.8)	1.48 \pm .50	12 th
5	Does size of the hearing aid matter?	109 (40.1)	163 (59.9)	1.60 \pm .50	1 st
6	Will you prefer wearing a hearing aid in spite of the compromised cosmetic appearance?	142 (52.2)	130 (47.8)	1.48 \pm .50	11 th
7	A hearing aid is not comfortable to use.	148 (54.4)	124 (45.6)	1.46 \pm .49	14 th
8	It is expensive to manage a hearing aid.	146 (53.7)	126 (46.3)	1.46 \pm .49	15 th
9	It is an embarrassment to wear a hearing aid in public.	143 (52.6)	129 (47.4)	1.47 \pm .50	13 th
10	Do you think using of hearing aid would make the user look awkward?	134 (49.3)	138 (50.7)	1.51 \pm .50	6 th
11	Will you accept people wearing hearing aids to social gatherings?	141 (51.8)	131 (48.2)	1.48 \pm .50	8 th
12	Do you think people react differently when someone wears a hearing aid?	141 (51.8)	131 (48.2)	1.48 \pm .50	9 th
13	Wearing hearing aids adds to psychosocial pressure.	140 (51.8)	132 (48.2)	1.48 \pm .50	10 th
14	Using a hearing aid would make the user isolated from other people.	137 (50.4)	135 (49.6)	1.49 \pm .50	7 th
15	Do you feel that instead of a hearing aid, parents or clients should follow traditional methods of treatment?	108 (39.7)	164 (60.3)	1.60 \pm .49	2 nd
16	Do you suggest your hearing-impaired friend [if any] go for a hearing aid?	120 (44.1)	152 (55.9)	1.56 \pm .49	3 rd
17	Will you accept a person who wears a hearing aid as your friend?	122 (44.9)	150 (55.1)	1.56 \pm .49	4 th

As shown in Table 5, about 66.5% of the respondents had good knowledge about hearing loss while 31.3% showed a positive attitude towards individuals with hearing loss. This implied that their knowledge of hearing loss did not translate to having a positive attitude towards persons with hearing loss. Table 6 is a table of associations between the socio-demographic characteristics of the respondents, their knowledge of hearing loss, and their attitudes towards individuals with hearing loss. The information provided in Table 6 shows that there was no significant association between the following socio-demographic characteristics and the respondents' knowledge of hearing loss: gender, age, faculty, program of study, and past or current experiences of hearing loss by friends/family members. There was also no significant association between age,

faculty, program of study, past or current experiences of hearing loss by friends/family members, or knowledge of an Audiologist.

On the other hand, Table 6 showed that a significant association existed between knowledge of an Audiologist and the observed knowledge of hearing loss. A significant association was also found between gender and the attitude of the respondents towards persons with hearing loss. This implied that the perceived information received by the respondents from various sources (indicated in Table 1) could have informed their knowledge and understanding about hearing loss while gender differences influenced the potential attitude that the respondents could exhibit towards persons with hearing loss.

Table 5. Level of knowledge about hearing health and variations in the respondents' attitudes towards persons with hearing loss

Variable	Good [n (%)]	Poor [n (%)]
Level of knowledge about hearing health	181 (66.5)	91 (33.5)
	Positive [n (%)]	Negative [n (%)]
Variations in the attitude of the respondents towards persons with hearing loss	85 (31.3)	187 (68.8)

Table 6. Association between sociodemographic variables, knowledge about hearing health and respondents' attitudes towards persons with hearing loss

Variables	Knowledge (Good)	P value	Attitude (positive)	P value
Gender				
Male	69	.16	73	.005
Female	112		114	
Age range of respondents (years)				
20-30	86	.67	86	.40
31-40	66		70	
> 41	29		187	
Faculty of				
Education	74	.85	74	.85
Agriculture	39		43	
Health Sciences	17		22	
Humanities	17		16	
Law	16		16	
Science and Technology	18		16	
Program of study				
Diploma	24	.50	24	.93
Bachelor's degree	94		100	
Honours degree	26		30	
Master's degree and above	37		33	
Experience of hearing loss by friends/family members				
Yes	62	.16	63	.23
No	119		124	
Heard about an Audiologist?				
Yes	128	.001	145	.44
No	33		28	
Not sure	20		14	

6. Discussion

Knowledge, understanding and attitude are constructs that shape and inform expected/observed social behaviour. Such behaviours can shape social capital significantly [61]. Using the principles and philosophy of the HBM [51, 52], this study assessed the implications of the constructs of knowledge, understanding and attitude on hearing health in Lesotho among 272 students selected from a publicly funded university in the country. The findings of the study indicated that the participants had a better understanding of hearing health in relation to the implications of excessive noise and wax in the ear. They understood that these could lead to hearing difficulties as well as the need for ear checks at accredited ear clinics/centres. The findings of this current study were expected as there are individuals with hearing loss in almost every community in Africa. This is because the WHO [8] has reported that about 39.9 million Africans have been diagnosed with moderate to profound hearing loss. Many other studies on the continent have also reported on the hearing loss statistics [3, 4, 6, 24-28, 36, 62, 63]. Given this number of studies and the statistics, it is clear that Sub-Saharan Africa may be described as an epicentre of hearing disability. And with the existence of so many persons with hearing loss, it is very likely that the participants in our study would have come across persons with hearing loss and have a substantial understanding of such conditions in terms of interpersonal relationships and communication tendencies.

Despite the findings on the participants' understanding/knowledge of hearing health, as many as 98% of the participants engaged in ear cleaning using cotton buds (ear buds), matchsticks, wet cloths, and other materials, and this posed a risk to their hearing health. This current finding buttressed the earlier findings of such risky health behaviour contributing to the spectrum of hearing loss in Sub-Saharan Africa [3, 4, 7, 17-23]. It was stated by Joubert et al. [28]; Kimball et al. [34]; Ndadi et al. [21]; Osisanya et al. [30, 31] that the causes of hearing loss have extended beyond biological causes in recent times. In other words, aside from the impact of environmental noise pollution, personal behaviour and poor hygiene also contribute to hearing loss. People need to exercise care when cleaning their ears as they can damage their hearing by using dirty implements. Use of dirty cotton buds (ear buds), matchsticks, wet cloths, and other materials for cleaning of the ears could increase the likelihood of ear infections and spread infections from one ear to the other [33, 35-37]. The foregoing risky hearing health behaviour did not correlate with the fact that this current study also observed that participants had adequate knowledge about hearing loss and its associated effects [1-3 16, 27]. What this implied was that although they assumed that they had adequate knowledge in terms of the fact that hearing loss exists and of some of the causes, they did not have sufficient knowledge about ear hygiene.

This study showed that participants were knowledgeable

about hearing screening and the need for early hearing assessments. This implied that the participants had fairly good knowledge of hearing health. The lack of understanding of the importance of ear checks in adulthood could be connected to the fact that settlements in Lesotho are widespread. There is a shortage of hearing healthcare centres. People have to travel vast distances to the hearing health centres that are available, and there are financial burdens associated with seeking hearing healthcare in approved ear care centres. It also appeared that the population was not adequately informed about the importance and significance of such adult health checks.

Olusanya et al. [36]; and Osisanya [33] aver that hearing loss is not culture or gender specific, and other studies have shown that hearing loss is associated with several aetiological factors such as excessive use of mobile phones on the highest volume, the cacophony of traffic, and noises from construction sites, recreational places and marketplaces [1, 3, 4, 7 22, 23, 28, 30-32, 62, 63]. Our study did not look at the gender and culture of those with hearing loss, but it did agree with the aetiological factors identified in these previous studies and deemed them to be responsible for some of the hearing loss found in Lesotho. This current study further noted that the distances to the hearing healthcare centres and the low socio-economic capacities of the Basotho people reinforced these factors as the causes of hearing loss identified in past studies. This current evidence was similar to the findings presented in the study of Adigun and Mngomezulu [64] whose study showed that the distances travelled by deaf pregnant women and the financial burdens associated with travel to the appropriate facilities were some of the major factors responsible for their late initiation/registration for antenatal care. Our finding of insufficient healthcare practitioners for hearing health support underscored the reports by Asamani et al. [49] and the WHO [8] when they bemoaned the state of healthcare in Lesotho. Asamani et al. [49] stated that there were only about 20,000 healthcare professionals across 18 health occupations in Lesotho in 2020. This was linked to the alarming rate of infant and maternal mortalities reported by the WHO [8], so it was plausible to link this lack of service providers to a lack of hearing healthcare.

Another finding of this study was that participants had a negative attitude towards hearing loss as a condition but not necessarily towards individuals with hearing loss. The foregoing was clarified during the semi-structured interviews as they revealed that the perceived negative attitude was informed by the implications of hearing loss, hearing aid usage in respect of maintenance, and how to receive immediate and cost-effective hearing healthcare when the need arose. One of the respondents (P1) expressed the following: *“due to the high cost of hearing aids and difficulties one may encounter for recurrent servicing of the device, I will not encourage someone close to me to get a hearing aid. At least not with the present potential health-related challenges in the country”*. The

quantitative and qualitative data analysed in this study gave credence to the submission by Kimball et al. [34] that peoples' negative attitude towards persons with hearing loss was based on lifestyle and the information available to them about hearing loss. Kimball et al. [34] believed that better knowledge and understanding about hearing loss would inform and improve people's attitudes and perceptions about hearing loss.

Both Kimball et al.'s [34] study and our study were in line with the assumptions of the HBM, where hearing health-related behaviour is a function of the interaction of various factors. These factors are perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. Siddiqui et al. [51]; and Snetselaar and Delahanty [52] also reported on this and according to Snetselaar and Delahanty [52], awareness and understanding of the psychosocial environment can predict potential health behaviours and inform the attitudes and beliefs of individuals about healthcare and lifestyle. While the findings of this study corresponded with those of the ASHA [35], the findings deviated from those of Elbeltagy et al. [27]; Keppler et al. [37]; and Lebeko et al. [29], who attributed the increase in the negative attitudes observed towards persons with hearing loss and hearing aid users to the increase in the population of persons with hearing loss in Sub-Saharan Africa. This is because our study showed that the attitude of the participants towards persons with hearing loss and hearing aid users was associated with the availability of the hearing healthcare services required, and the distance and financial burdens associated with travel to such facilities. The same was found by Govender and De Jongh [38]; Hartley et al. [40]; Hougaard and Ruf [39]; Kochkin [43]; and Ogunkeyede et al. [4].

This study showed a significant association between knowledge of an Audiologist and the knowledge observed about hearing loss. This implied that the participants with adequate understanding about the role and function of an Audiologist had better knowledge about hearing loss. An additional significant association was found between gender and the attitude of the respondents towards persons with hearing loss and hearing aid users. This implied that the perceptions of persons with hearing loss and hearing aid users were influenced by gender differences. The studies by Govender and De Jongh [38] in South Africa and Ogunkeyede et al. [4] in Nigeria revealed that there was increasing awareness and knowledge about hearing healthcare professionals. Despite the established awareness and knowledge about hearing healthcare professionals in Africa, the research evidence from the studies of Goh et al. [42]; McCormack and Fortnum [65]; and Meister et al. [44] revealed that attitudes toward the hearing impaired and hearing aid usage were not evenly matched and such attitudes were influenced by several factors which included gender differences. While this current study found an association between perceived knowledge about the professional role of an Audiologist in relation to hearing loss and an association between gender

and the attitudes of the respondents towards persons with hearing loss and hearing aid users; the study by Meister et al. [44] found an association between personality traits, the self-perceived severity of hearing loss, knowledge and attitude towards hearing loss, and hearing aid usage. Our finding corresponded to the submissions by Hickson et al. [46] and Kochkin [43] but not to those of Aravinda et al. [41]; and Brooks and Hallam [47].

7. Conclusions and Recommendations

This study assessed the situation of hearing healthcare in Lesotho vis-à-vis the understanding, knowledge, and attitudes of 272 participants and used the assumption of the Health Belief Model to do so. The study concluded that Basotho people had a good understanding and knowledge of hearing health as they understood that excessive noise and wax in the ear could lead to hearing difficulties. They also understood the need for ear checks at accredited ear clinics/centres. Despite this, they still engaged in risky hearing healthcare behaviours. The study found that the participants had negative attitudes towards hearing loss as a condition, but not necessarily towards individuals with hearing loss. Although the present study did not break a new ground, the study shows that in that locality, that is, Basotho people had a good understanding and knowledge of hearing health because they understood that excessive noise can lead to hearing loss (sensorineural) and wax impaction could also lead to hearing loss (conductive). Also, an association was established about knowledge of hearing health and hearing loss and gender and attitudes towards individuals with hearing loss and hearing aid users. The aforementioned may not only be applicable to Basotho people but other people around the globe who have access to this study.

Based on our findings and conclusions, our results show that there is a lot of work to do to change the attitudes of people in Lesotho. It is therefore important for government and non-governmental agencies to increase awareness about hearing healthcare in the country. It is imperative that hearing healthcare facilities be made readily available to Basotho people in locations close to them. Mobile hearing healthcare services may be implemented as this will make it easier for Basotho people to get occasional ear assessments and such efforts will reduce the financial burden on them in their quest to access hearing healthcare services. We encourage the training and retraining of hearing healthcare professionals in the country. The government should prioritise the hearing health education of its citizenry using the mass media and internet options available to them. Students in the country should be encouraged to choose hearing healthcare courses in higher education institutions so that they can be trained as hearing health professionals and later serve the hearing health needs of the country.

8. Limitations and Direction for Future Research

This current study employed a mixed method for data collection among students of a publicly funded tertiary institution in Lesotho. We believed that their level of education must have informed the results observed in this study. In other words, the findings of this study would not necessarily reflect the attitudes and knowledge of people who lived in rural areas and the mountains. Also, while we found an association between gender and the attitude towards persons with hearing loss and hearing aid users, our study did not provide the gender (male or female) differences with respect to the attitudes of the participants. We therefore suggest that future studies of this magnitude and scope assess the hearing health in Lesotho from the perspectives of health professionals, out-of-school participants, and rural dwellers. We are of the opinion that such research efforts may provide more robust evidence about the state of hearing health in Lesotho.

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