

Awareness of Ear and Hearing Health Among Young Adults

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Abstract

Background: Awareness of audiological issues has never been measured in the young adult community even if the World Health Organization (WHO) has detected a common urgent need for action to prevent and manage ear diseases and hearing loss.

Materials and Methods: To evaluate young adult community awareness of managing and preventing ear disease and hearing loss, an online audiological questionnaire was used. The questionnaire was formulated on the basis of WHO material concerning the major specific audiological issues and attitudes, focusing on knowledge of infant hearing loss, correct management of the ears including cleaning and treating, the effect of overexposure to loud sounds and noise and underestimated ear symptoms leading to diagnostic delay.

Results: 312 students responded to the online questionnaire in this cross-sectional study from four universities (two public and two private) in Sana'a city, Yemen. More than 80% of correct responses were given to half of the statements however the overall correct responses were 73.1% indicating lack in certain important knowledge.

Conclusion: The results showed that, there is a need for awareness campaigns in order to educate the Yemeni population. Moreover, indicated the need for conducting a survey on a much larger scale with the intention of developing appropriate health communication strategies for promotion of ear and hearing health.

Keywords: Cross-sectional; Health knowledge; Attitudes; Practice; Hearing Health; Yemen; Sana'a University

Introduction

Since 2015, Yemen has encountered one of the world's most devastating armed conflicts where more than 100,000 people were killed up to 2019. Over the past seven years, nearly six million Yemenis have been displaced from their homes (4.3 million internally displaced) to be the fifth largest number of internally displaced people (IDPs) in the world. More than 70 percent of the population in dreadful need of humanitarian assistance. Even before the recent conflict, Yemen was the most vulnerable country in the Middle East. It ranked among the world's worst in malnutrition rates and half of its population was living in poverty, without access to safe water [1,2]. The ongoing conflict has severely affected the

country's health-care system: barely half of public health facilities are fully functional; salaries for health-care workers went unpaid from October, 2016, and essential medications and equipment are in short supply or absent [3]. Moreover In 2018, nearly 8.8 million people (30.6% of Yemenis) were estimated to live more than a 30-min travel time from the nearest partially or fully functional public primary health-care facility, and approximately 12.1 million people (42.4% of Yemenis) lived more than 1 h from the nearest partially or fully functional public hospital [4].

There were 248 otolaryngology clinics providing ENT care in 2020. Among these, (75%) are private facilities, and (18.9%) belong to the Ministry of Health and Medical Colleges. The

majority (61.3%) of ENT clinics are located in Sana'a (city), and the governorate of Aden. There is dreadful need for Evaluation and determination the main causes of hearing loss by collecting and re-evaluating existing data on deafness and hearing loss and conducting national survey on major causes of hearing loss. Of most importance is raising awareness among the community toward the hearing loss and prevention of hearing impairment [5,7].

It has been reported in 2018 that many causes of hearing loss that could be prevented persist or are on the rise. These include ear infections, ototoxic drug use and noise exposure. Over one billion young people in the world face the risk of developing permanent hearing loss due to the way they listen to music; this risk can be avoided through better awareness and legislation. Despite the overwhelming predictions, neither policy-makers nor the public prioritize hearing loss [6].

An extensive internet search for previous studies in Yemen was conducted, however, revealed absence of studies about awareness of ear and hearing health in Yemeni population. The aim of this study was to measure college student's community' knowledge of managing and preventing ear disease and hearing loss using an audiological questionnaire.

Materials and Methods

This was a cross-sectional study conducted in four universities (two public universities and two private universities) in Sana'a city, Yemen in October 2022.

The aim of the study was to evaluate knowledge on the most important audiological issues and attitudes of Yemeni young adults toward hearing health. A self-administered online audiological questionnaire, coined by Di Berardino, *et al.* on the basis of WHO material, focusing in particular on the primary prevention and infant hearing care, was used [8]. He stated that it is an easy and feasible tool. The questionnaire contains 14 items, divided into 4 domains; specifically, 3 sentences regarding knowledge of infant hearing loss, 5 concerning the correct management of the ears including cleaning and treating, 3 focusing on the effect of overexposure to loud sounds and noise, 3 on underestimated ear symptoms leading to diagnostic delay (Table 1). The relationship between the subjects' responses (correct or wrong) and personal data (gender, previous otitis media, relatives affected by hearing

loss, exposure to noise) was examined calculating the contingency tables, the Mantel-Haenszel's test, the odds ratio (OR) and the confidential interval (CI). p values of less than 0.05 were considered to be significant.

Table 1: Questionnaire to evaluate public awareness of ear and hearing management.

Main-areas	Item
Infant hearing loss	1. It is possible to diagnose deafness in infants shortly after birth. TRUE
	2. A deaf-mute cannot speak because of defects in the vocal tract. FALSE
	3. Hearing loss may cause attention deficits thus reducing school performance. TRUE
Cleaning and treating	4. Cotton buds are necessary for ear cleaning and are the safest means. FALSE
	5. Ear drops are sufficient to treat earache. FALSE
	6. Otitomycosis (itchy ears) can be contracted at the swimming pool. TRUE
	7. Drug abuse does not provoke auditory hallucinations or modifications of hearing quality. FALSE
Physical agents and overexposure	8. Hearing aids need to fit accurately to provide the maximum benefit. TRUE
	9. Kisses or slaps on the ears do not cause hearing problems. FALSE
	10. Listening to music for more than 3 h a day using earphones may cause permanent hearing loss. TRUE
	11. There are no tables recommending a reduction in the duration of exposure to high intensity noises. FALSE
Diagnostic delay	12. Irritating perception of sound (e.g. hearing metallic voices) and/or a reduction in hearing clarity (such as a sensation of having cotton wool in the ears) require medical advice. TRUE
	13. Sudden hearing loss is an emergency and requires an immediate audiological assessment. TRUE
	14. Age-related hearing loss may affect behavior. TRUE

The data retrieved from website to excel spreadsheet and all statistics were performed using the Statistical Package for the Social Sciences 26.0 for Windows software package (SPSS Inc., Chicago, IL, USA). Only those who agree the informed consent, answered the anonymous questionnaire. The study was approved by Ethical Committee of our department.

Results

In this study, 312 participants, age range between 19 and 30(mean 21.27 SD 1.79);184 (59%) were males and 128 (41%) were females.

History of ear or hearing problem reported by 33 (10.6%) while relatives with ear or hearing problem was reported by 139 (44.6%) of responders.

Noise exposure was prevalent where 139 (44.6%) reported listening to loud music, 132(42.3%) work in noisy places and 193(61.9%) are using headphone loudly.

Smoking reported by 24 (7.7%) participants.

The responses of participants to the 14 items of the questionnaire is shown in (Figure 1). The cumulative responses to main areas are shown in (Figure 2). The burden of hearing loss on school performance is well known to 93.6% as well as sudden hearing loss 95.8%. The correct responses exceed 80% in only seven statements while four statements did not reach 50%. Two were about infant hearing loss (Statements 1and 2) resulting in 58.6% correct answers in this main area. The others were about physical agents and overexposure (Statements 10 and 11) resulting 61.9% correct answers in this area. The knowledge of the main area; diagnostic delay (89.6%) was the most known among participants whereas knowledge about infant hearing loss (58.6%) was the least.

Eight significant interactions between some personal data and responses to the statements were found and the corresponding contingency tables are shown in (Table 2).

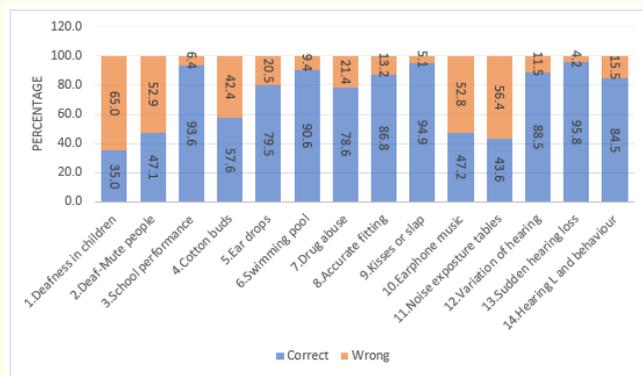


Figure 1: Percentage of responses to quistionare items.

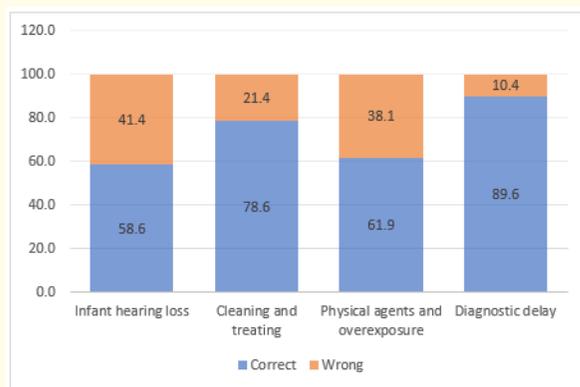


Figure 2: Percentage of responses to main areas.

Items	Response	Gender		Mantel-Haenszel	
		Males (%)	Females (%)	p value	OR (CI)
It is possible to diagnose deafness in infants shortly after birth.	Correct	28	44.9	0.003	0.48 (0.30 - 0.77)
	Wrong	72	55.1		
Items	Response	Previous diagnosis with hearing loss		Mantel-Haenszel	
		Yes (%)	No (%)	p value	OR (CI)
Cotton buds are necessary for ear cleaning and are the safest means	Correct	37.5	59.9	0.026	0.40 (0.19 - 0.86)
	Wrong	62.5	40.1		
Kisses or slaps on the ears do not cause hearing problems.	Correct	84.4	96.1	0.016	0.22 (0.07 - 0.69)
	Wrong	15.6	3.9		

There are no tables recommending a reduction in the duration of exposure to high intensity noises.	Correct	21.2	46.2	0.011	0.31 (0.13 - 0.75)
	Wrong	78.8	53.8		
Items	Response	Using headphones loudly		Mantel-Haenszel	
		Yes (%)	No (%)	p value	OR (CI)
Irritating perception of sound (e.g. hearing metallic voices) and/or a reduction in hearing clarity (such as a sensation of having cotton wool in the ears) require medical advice	Correct	85	94.1	0.023	0.35 (0.15 - 0.84)
	Wrong	15	5.9		
Items	Response	Listening to loud music.		Mantel-Haenszel	
		Yes (%)	No (%)	p value	OR (CI)
Drug abuse does not provoke auditory hallucinations or modifications of hearing quality.	Correct	67.9	87.1	0.000	0.18 (0.14 - 0.55)
	Wrong	32.1	12.9		
Items	Response	Work in place with loud noise.		Mantel-Haenszel	
		Yes (%)	No (%)	p value	OR (CI)
Listening to music for more than 3 h a day using earphones may cause permanent hearing loss.	Correct	54.6	41.9	0.036	1.67 (1.06 - 2.63)
	Wrong	45.4	58.1		
Items	Response	Smoking		Mantel-Haenszel	
		Yes(%)	No (%)	p value	OR (CI)
Cotton buds are necessary for ear cleaning and are the safest means	Correct	33.3	59.6	0.032	0.34 (0.14 - 0.82)
	Wrong	66.7	40.4		

Table 2: Contingency tables and statistical results of interactions between responses and personal data of participants.

Although the knowledge about problems of infant hearing loss was the least known to all, the females revealed a better knowledge about the deafness in children (statement 1; $p = 0.003$). Participants with previous diagnosis with hearing loss showed lower knowledge about cotton buds (statement 4; $p = 0.026$), kisses or slap (statement 9; $p = 0.016$) and Noise exposure tables (statement 11; $p = 0.011$). Those using headphones loudly showed lower knowledge about variation of hearing (statement 12; $p = 0.023$), similarly workers in places with loud noise reported lower knowledge about earphone music (statement 10; $p = 0.036$). However, better response retrieved from listeners to loud music about drug abuse (statement 7; $p = 0.000$). Finally, nonsmokers showed higher knowledge about cotton buds (statement 4; $p = 0.032$). The overall percentage of correct responses was 73.1% which is generally low.

Discussion

A total of 312 participants (mean age 21.27 SD 1.79) responded the questionnaire. Males were (59%) and (41%) were females,

mostly similar to gender distribution in Malaysian study [10] whereas in Saudi study females: 57.1% [11].

In the present study, 10.6% of the participants reported a history of ear and hearing problem. These finding were similar to American study, [14] where approximately 10% of college students reported a previous history of hearing impairment. But higher than another study that showed only 7.3% of the individuals reported a hearing impairment [9] and British study ($n = 7/357$), [12] However, it is much lower than the findings reported by (Di Berardino., *et al.*) (54.7%) [8] and Saudi study, 24.8% where higher percentage of males reported hearing problems than females (30.6% vs. 20.4%) [11]. In Yemen (AL-MAHBASHI., *et al.*) reported that males are affected more than females. He attributed this difference to exposure to trauma and noise. Moreover, males are more affected by senile hearing loss earlier than females. In addition, women are socio-economically under privileged in our society so that a considerable proportion of them may not get medical attention for this chronic problem [7].

In this study, 44.6% of participants reported relatives with hearing problem. This finding is higher than previous study in Italy where (38.6%) reported having relatives affected by hearing loss [8]. Interestingly in Jordan only 22.4% experienced hearing loss through relatives (mainly grandparents) or friends suffering from hearing loss problems [9]. AL-MAHBASHI, *et al.* stated that problematic and very problematic quality of life in his Yemeni patients was found in 28.1% as compared to 9.6% in the control group. The difference may be attributed to feeling of isolation, lower productivity and decreased social activities and low self-esteem in the patient group. Interventions to correct these problems either surgical or hearing aids are needed according to patient's situation [7].

The dangers of significant exposure to music on hearing mechanics in adolescents and young adults continue to increase with modern music culture. Legislation has proved insufficient and in fact nonexistent for most recreational music listening even though many exposure levels exceed laws for occupational noise. Because of this lack in government regulations, self-regulation is the only method in which can hearing mechanics be protected from music exposure. Adolescents and young adults have been shown to be the age group most at risk, and NIHL is already evident and increasing among this group. It is of vital importance that this group is made aware of the immediate and future dangers, and how changes in listening behaviors do not necessarily lower their enjoyment. However, because the consequences are not immediate, it is difficult for the young to perceive the seriousness of a problem that may not present itself for many years. Conventional education may go a little way in helping to raise awareness but a raised awareness of consequences does not, in itself, change behavior [13].

In our study noise exposure was prevalent where 139(44.6%) reported listening to loud music. This is almost similar to students surveyed in British where 46.2 per cent (165 out of 357 students), attended a nightclub at least once per week [12] however, higher than that of Italy in which (28.7%) of the interviewed subjects were exposed to noise [8]. It is also lower than another study where 79.2% of participants reported visiting parties with loud music [9].

The participants who work in noisy places in our study were 132(42.3%). These may be unaware of the hazards or their rights in hearing protection.

The listening to loud music with earphones reported by 193(61.9%) in our study. This is lower than 81.2% which is reported by (Alnuman N., *et al.*) in Jordan. In his study the majority (60.6%) of students were daily media device users with high-volume settings. In contrast to their report, only 13% of Saudi study participants reported 6–9 times hearing session per week and 11% up to 10 times per week. Another notable difference is that only 44% of Saudi participants were listening to volume more than 70%. Of more details about behavior, (Hussain., *et al.*) stated that twenty-two percent of adults preferred output volume levels equal to or more than 91 dBA in an environment with background noise, and all used their PLD for equal to or more than 2 h/day or listened for more than 4 h/day at preferred volume levels equal to or more than 88 dBA with background noise, thus exceeding 100% of the maximum recommended daily noise dose [10]. The majority of Saudi participants (45.3%) preferred using earphones, but half of the participants listened to a noise source for less than 1 h/session [11], similar result has been documented in Malaysia (2013), where earphones were used by 51% of the study participants [15].

92.3% of our participants were nonsmoker recording better rate than participants in the study conducted by Alzhrani., *et al.* where (82.1%) are nonsmoker [11].

The responses of participants showed that the burden of hearing loss on school performance is well known to 93.6% as well as sudden hearing loss 95.8% and traumatic (kisses and slaps 94.9%) causes of hearing loss. This high awareness may be due to prevalence of these conditions in Yemen. However, there is no national survey about hearing loss [5]. In addition to these there were four more responses exceeded 80% giving appropriate level of awareness.

The correct answers of two statements about infant hearing loss (statement 1: 35.0% and statement 2: 47.1%) did not reach 50%. This lack of knowledge concerning deaf children has already been reported by Williams., *et al.* [10] in 1982 among parents of children with a diagnosis of severe-profound hearing loss within the first year of their audiological evaluation. They reported that 72% did not understand the impact of hearing loss on their children, 64% did not understand the effect of the child's hearing loss on their own life and 84% was unable to comprehend the majority of information given by the audiologist. However, in our

study the effect of hearing loss on school performance was well known (93.6%) by responders. Notably females revealed a better knowledge (Female 44.9% vs Male 28%) about the deafness in children (statement 1 $p = 0.003$).

Similarly, two other statements about physical agents and overexposure (statement 10; 47.2% and statement 11; 43.6%) were poorly known by participants. This domain reflects knowledge about incurable hearing loss. Even in presence of WHO guidelines, in particular on the use of mp3 players for long periods of time, the participant's knowledge is lacking. This indicates the need for extensive educational programs in different media for whole population. A study among Saudi adults in Albaha region suggests gaps in community knowledge regarding the causes and protective measures against NIHL [17]. Majority (78%) of the participants believed that doctors can cure hearing loss. This belief that might make population less interested in preventive measures and more susceptible to the development of NIHL.

The knowledge of the main area; diagnostic delay (89.6%) was the most known among our participants. This is comparable with previous study in Melan where their responses were more than 80% in this macro-area [8]. On the other hand, their overall results were generally positive reaching 80% or more however, our study overall results were 73.1% correct answers.

Limitations

There were certain limitations in conducting the study notably the cross-sectional study design. There could also have been a possibility of information bias as the data were all self-reported. The online nature although widely used in researches, was another factor as responders are not observed and can ask google for unsure answers.

Conclusion

The current study has identified for the first time that there is an unsatisfactory awareness toward ear and hearing health in the young adult community. Clearly, there is a need for awareness campaigns in order to educate the Yemeni population. Moreover, indicated the need for conducting a survey on a much larger scale with the intention of developing appropriate health strategies for promotion of ear and hearing health.

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