J. Amr. Uni. ***04*** *(2024) p.141*

Knowledge and Practice of Amran University Students toward Ear and Hearing Health

Mohammed M Alhouthi[1,*], Nasser Y. Al-ozaib[2]
[1]Otorhinolaryngology Department, Faculty of Medicine and Health Sciences, Amran University, Yemen
[2]Otorhinolaryngology Department, Faculty of Medicine and Health Sciences, Sana'a University.

Abstract

The World Health Organization (WHO) has detected an urgent need for action to prevent and manage ear diseases and hearing loss. However, the first step is to identify the areas of knowledge deficiency within the population. The aim of the study was to evaluate knowledge of university students' community in managing and preventing ear disease and hearing loss. This was a cross-sectional study conducted during February 2023 at Amran University using an online ontological questionnaire. Data was retrieved and processed in Excel spreadsheet and analyzed using SPSS version 29. A total of 330 participants responded to the online questionnaire, of whom 84.5% were male, with a mean age of 21.43 ± 1.77. Among them, 15.8% reported previous ear problems, while 41.2% had relatives with ear or hearing problems. Exposure to loud noise was reported by 37.6%, and 52.2% reported listening to headphones loudly. The overall correct response rate to the statements was 73.2%, indicating a lack of certain important knowledge. The study results showed a need for official campaigns to educate the Yemeni population. Moreover, they indicated the necessity of conducting a survey on a much wider scale to aid in the development of appropriate health communication strategies and the promotion of ear and hearing health.

Keywords: Cross-sectional; Health knowledge; Attitudes; Practice; Hearing Health; Yemen; Amran University

الملخص: وجدت منظمة الصحة العالمية حاجة ملحة لاتخاذ اجراءات ناجعة من اجل معالجة امراض الاذن والسمع وكذا الوقاية منها. ومن ثم فان الخطوة الاولى لتنفيذ هذه الاجراءات هي التعرف على مكامن الضعف في المعلومات المتوفرة لدى المجتمع. هدفت الدراسة الى تقييم مستوى معرفة وممارسة طلاب الجامعة فيما يتعلق بمعالجة أمراض الأذن وفقدان السمع والوقاية منها. كانت هذه دراسة مقطعية أجريت خلال شهر فبراير 2023 في جامعة عمران باستخدام استبيان طب الأذن عبر الإنترنت. تم استرجاع البيانات ومعالجتها في جدول بيانات **Excel** وتحليلها باستخدام برنامج **SPSS** الإصدار 29. استجاب 330 مشاركًا للاستبيان عبر الإنترنت، 84.5% منهم ذكور ومتوسط العمر (21.43 ± 1.77) وكانت الاستجابات كالتالي. 15.% منهم أبلغوا عن مشاكل سابقة في الأذن بينما 41.2% لديهم أقارب يعانون من مشاكل في الأذن أو السمع. التعرض للضوضاء العالية عند 37.6% منهم والاستماع عبر سماعة الرأس بصوت عالٍ بنسبة 52.2%. كان اجمالي الإجابات الصحيحة على العبارات 73.2% مما يشير إلى نقص في بعض المعلومات المهمة. أظهرت نتائج الدراسة أن هناك حاجة إلى حملات رسمية لتوعية المجتمع اليمني. علاوة على ذلك، أشارت إلى الحاجة إلى إجراء مسح على نطاق أوسع للمساعدة في تطوير استراتيجيات التثقيف الصحي المناسبة وتعزيز صحة الأذن والسمع.

Introduction:

Hearing loss is a barrier to communication and language development. It is associated with delayed cognitive development in children and early cognitive decline in older adults. Untreated hearing loss interferes with educational and employment opportunities, hampers social interaction and emotional well-being and often creates an economic challenge. As a matter of fact, it is one of the leading causes of morbidity, in terms of disability adjusted life years (DALYs) and years lived with disability (YLD), globally and imposes a global cost of more than $ 980 billion annually, hence, It potentially risks the global goal of United Nations Member States to end poverty and ensure that all people on this planet enjoy peace and prosperity by 2030 [1, 2].

The prior few decades have seen game-changing expansions in the field of hearing technology, diagnostics and telemedicine with innovations that enable ear diseases and hearing loss to be identified at any age and in any setting. Medical and surgical management, hearing aids, cochlear implants, rehabilitative therapy, sign language and captioning are solutions which can guarantee that people with ear diseases or hearing loss gain access to education and communication and

[*]**Corresponding Author:** Emails: dr5mmojahed@gmail.com

thereby have the chance to fulfil their potential. Despite the existence and effectiveness of these interventions, the majority of those in need do not have access to them. Most people with hearing loss live in low-income locales where human resources and services for ear and hearing care are not commonly reachable [2].

In 2018, Garber et al conducted a study on access to healthcare in Yemen during the war. They estimated that approximately 8.8 million people (30.6% of the total estimated Yemeni population of 28.7 million) lived more than a 30-minute travel time away from the nearest fully or partially functional public primary healthcare facility. Furthermore, more than 12.1 million people (42.4% of the Yemeni population) lived more than an hour away from the nearest fully or partially functional public hospital, assuming access to motorized transport. The study ranked districts according to the number of people living beyond acceptable travel times to facilities and services and found that access differed widely by district and type of health service, with almost 40% of the population living more than 2 hours from comprehensive emergency care. He considered this as emergency situation facing the Yemeni health system where even many front-line districts were among those with the poorest access services [3]. The difficulty to access health care facilities is aggravated by the fact that there were only 248 otolaryngology clinics providing ear care in Yemen in 2020. The majority 152 (61.3%) of these clinics are localized in Sana'a (city), Aden and Hadhramout governorates. Most districts and some governorates are devoid of ear and hearing health care [4].

The Yemeni situation of ear and hearing health was not nationally investigated particularly in terms of types and prevalence of hearing loss or knowledge and practice of population. The WHO [1, 2] has identified the following strategic areas of work for 2018-2021:

- Gather and collate data to drive action for hearing loss.
- Undertake effective evidence-based advocacy for prioritization of ear and hearing care.
- Support strategy development and implementation in WHO Member States.
- Develop and promote the 'Make Listening Safe' initiative.

However, none of these tasks was officially achieved in our situation. This study falls in the first work area.

The aim of the study was to identify the level of knowledge and practices among Amran University students regarding ear and hearing health. This study contributes to building a comprehensive understanding of the awareness levels pertaining to ear and hearing health, considering the lack of information on this topic in national surveys or previous research. An internet search revealed the absence of similar research conducted at Amran University.

Materials and methods:

This was a cross-sectional study design employed to collect data at a single point in time for assessment of the level of awareness toward ear and hearing health among Amran university students. It was conducted during February 2023 at Amran university using an online otological questionnaire. The questionnaire was formulated on the basis of WHO material covering the major specific otological 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 as detailed in (Table 1) [15].

The questionnaire was distributed among students using social media platforms. The data was retrieved from a Google Form and transferred to an Excel spreadsheet. All statistical analyses were performed using SPSS 26.0 for Windows. The study was conducted in accordance with ethical guidelines and received approval from our department. Only those who agreed to the informed consent were invited to participate and answer the anonymous questionnaire.

Table 1: The questionnaire items.

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. Otomycosis (itchy ears) can be contracted at the swimming pool. TRUE
	7. Drug abuse does not provoke auditory hallucinations or modifications of hearing quality. FALSE
	8. Hearing aids need to fit accurately to provide the maximum benefit. TRUE
Physical agents and overexposure	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

Results

330 students with age range 19-25 years; mean (21.43 ± 1.77) responded to the online questionnaire. Females were 51(15%) whereas 279 (85%) were males. History of ear or hearing problem reported by 52 (15.8 %) while relatives with ear or hearing problem was reported by 136 (41.2 %) of responders. Noise exposure was prevalent where 124 (37.6 %) reported listening to loud music, 122 (37.0 %) work in noisy places and 182 (55.2 %) are using headphone loudly. Smoking reported by 26 (7.9 %) participants.

The overall correct responses to statements were 73.2%. The responses of participants to the 14 items of the questionnaire are shown in (Figure 1).

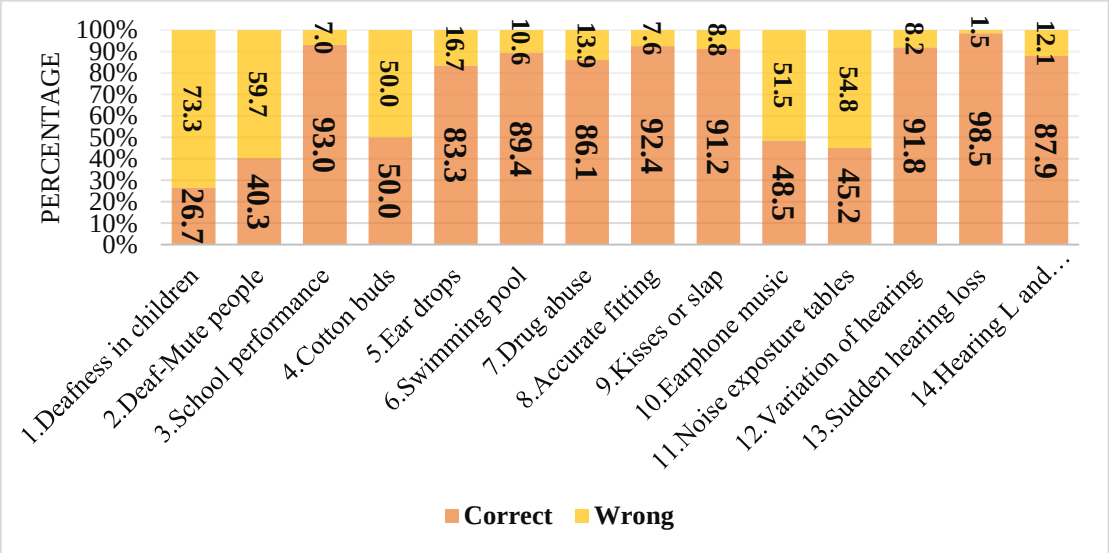

Figure 1: The frequency of correct responses.

The effect of hearing loss on school performance was well known to 93.0% as well as sudden hearing loss 98.5%. The correct responses exceed 80% in nine statements while four statements did not reach 50%.

The cumulative responses to main areas are shown in (Figure 2).

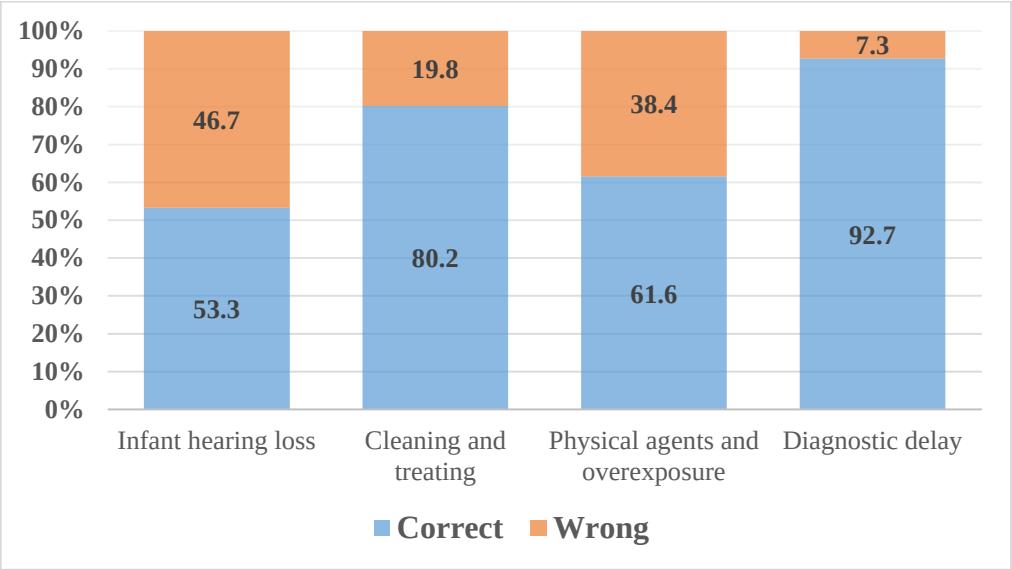

Figure 2: The cumulative responses to main areas

Notable shortage in understanding of two statements about infant hearing loss (Statements 1and 2) resulting in 53.3% correct answers in this main area. The others were about physical agents and overexposure (Statements 10 and 11) resulting 61.6% correct answers in this area. The knowledge of the main area; diagnostic delay (92.7%) was the most known among participants whereas knowledge about infant hearing loss (53.3%) was the least.

Discussion

This study surveyed a total of 330 university students who responded to the online questionnaire with mean age (21.43 ± 1.77). Females were 51(15%) whereas 279 (85%) were males with female participation less than previous studies [9, 10, 11]. 15.8 % of the participants reported a history of ear and hearing problem which is more than in the American study, [12] where approximately 10% of college students reported a previous history of hearing impairment and another study that showed only 7.3% of the individuals reported a hearing impairment [13] and British study (n = 7/357) [14]. However, it is much lower than the findings reported by (Di Berardino., et al.) where 54.7% of his sample had history of ear problem. The high prevalence in his study was attributed to age factor where their mean age was 51.83 ± 16.57 years and range was 13–83 years [15]. This gives us a clue that a wider scale study or survey covering all age spectrum and gender will give a clear picture about the prevalence of hearing loss and ear problems.

In this study, 41.2% of participants reported having relatives with hearing problems, which is consistent with a previous study [9] among Yemeni students. However, it is higher than another previous study [10] where 38.6% of participants reported having relatives affected by hearing loss. Interestingly, in Jordan, only 22.4% of participants reported facing hearing loss through relatives (mainly grandparents) or friends suffering from hearing loss problems [13].

Regarding the practice, the majority of participants reported using headphones loudly (55.2%), and a considerable percentage of them reported exposure to loud music (37.0%) and working in a place with loud noise (37.6%). These findings are consistent with a previous study among Yemeni students [9] and another reported high prevalence of noise-induced hearing loss (NIHL) among young adults due to exposure to loud music and noise [6]. Because NIHL is incurable but preventable the WHO [1, 2] considered the following protective and preventive factors for prevention of noise induced hearing loss:

- Keeping the volume of the personal audio devices < 80 dbs.
- Using carefully fitted and noise cancellation earphones or headphones.
- Limiting time spent listening using personal audio devices.
- Taking short breaks away from loud sounds.
- Regularly using earplugs in noisy situation.

- Maintaining a distance from the sources of noisy sound.

Moreover, it is obvious that most of participants reported exposure to different types of noise and are prone to NIHL if they do not know the risk or ignore protective measures.

Exposure to cigarette smoke clearly increases an individual's risk of hearing loss. Hearing loss could be due to the oxidative and vascular effects of cigarette smoke; or the direct ototoxic effect that may affect neurotransmission of auditory stimuli [1]. Smoking reported only by 26 (7.9 %) participants which reflects high awareness to its bad effects on human health in general.

Regarding the knowledge of the main area (infant hearing loss), the results showed that the majority of participants had good knowledge about the effect of hearing loss on school performance (93.0%). This may be due to high prevalence of the condition among their community. However, knowledge about other aspects of this area was poor, as indicated by the statements about deafness in children and deaf-mute child where the correct responses were 26.7% and 40.3% respectively. The poor knowledge in these two statements was reflected on the main area so only 53.3% of the responses were correct. This can be attributed to lack of formal information during their secondary school together with lack of official advocacy to raise public awareness toward hearing health.

Regarding the knowledge about the main area (Cleaning and treating), 80.2% of responses were correct. The highest score in this area was regarding the most technical statement concerning hearing aid fitting where 92.4% corrected answers was obtained. 50.0% of participants did not know the correct answer regarding cotton buds while the correct answer to the other statements (statement no. 5, 6, 7) was successfully known.

In his study, Keppler, H., et al. found that, participants were aware of the impact of excessive and prolonged music exposure on hearing. Although the most prevalent form of noise exposure in these rural villages was music which is often played very loudly in the close confines of taxies, parties as well as at most events. Furthermore, the use of cell phones and MP3 players is also quite high as most teenagers and young adults use earphones to listen to music [7]. In our study the knowledge about the main area (physical agents and overexposure) was poor. Only 61.6% of responses were correct. Although, the majority of participants (91.2%) had good knowledge about the effect of kiss or slap on the ears as a cause of hearing loss, the knowledge about (Statements 10 and 11) was poor. Only 48.5% of the participants knew that listening to music for more than 3 hours a day using earphones may cause permanent hearing loss. The lack of knowledge about the '**Make Listening Safe**' initiative, explains why 55.2 % of the participants are using headphone loudly. In response to the statement "There are no tables recommending a reduction in the duration of exposure to high intensity noises", only 45.2% correct responses were retrieved. The absence of knowledge about the risk of overexposure to noise at work, the ideal limits of noise and the protective actions against high noise level makes population in danger of noise induced hearing loss (NIHL) which is incurable.

Regarding knowledge of diagnostic delay, all the statements had more than 80% of correct answers. The highest students' awareness among all the questionnaire (98.5%) was observed on the (statement no. 13) "Sudden hearing loss is an emergency and requires an immediate audiological assessment".

Finally, the overall correct responses to the questionnaire statements were 73.2%. Although, our participants were educated; their correct responses were lower than the general population of Melan city where their answers to the questionnaire were correct in more than 80% [15]. The findings of this study have important implications for the development of educational programs to improve the knowledge and practices of university students as well as general population towards ear and hearing health. Such programs should focus on raising awareness about the harmful effects of noise exposure and the importance of early detection and prevention of hearing loss. Moreover, the programs should emphasize the proper use of hearing aids and the importance of seeking medical advice for ear diseases.

Limitations

The study relied on self-reported data, which may be subject to recall bias or social desirability bias. Being online was another factor where respondent was not observed.

Conclusion

The study results showed that, there is a need for official campaigns to educate the Yemeni population. Moreover, it indicated the need for conducting a survey on a much wider scale to help for development of appropriate health communication strategies and promotion of ear and hearing health.

References

[1] WHO Releases the World Report on Hearing | Adult Hearing, 2021? \[Online\]. Available: https://adulthearing.com/portfolio/who-releases-the-world-report-on-hearing/.

[2] "World report on hearing," Geneva: World Health Organization, 2021. \[Online\].Available: https://apps.who.int/gb/ebwha/pdf_files/WHA70/A70_R13-en.pdf.

[3] Garber, K., Fox, C., Abdalla, M., Tatem, A., Qirbi, N., Lloyd-Braff, L., Hassen, K. (2020). Estimating access to health care in Yemen, a complex humanitarian emergency setting: a descriptive applied geospatial analysis. The Lancet Global Health, 8(11), e1435-e1443.

[4] Mohamed Y Al-Mahbashi., et al. "Analysis of Otorhinolaryngology Care in Yemen". Acta Scientific Otolaryngology 2.12 (2020): 80-86.

[5] Joubert, K., Sebothoma, B., & Kgare, K. S. (2017). Public awareness of audiology, hearing and hearing health in the Limpopo Province, South Africa. South African Journal of Communication Disorders, 64(1), 1-9.

[6] Basner, M., Babisch, W., Davis, A., Brink, M., Clark, C., Janssen, S., & Stansfeld, S. (2014). Auditory and non-auditory effects of noise on health. The Lancet, 383(9925), 1325-1332.

[7] Keppler, H., Ingeborg, D., Sofie, D., Bart, V. D. B., & Paul, C. (2015). The effects of a hearing education program on recreational noise exposure, attitudes and beliefs toward noise, hearing loss, and hearing protector devices in young adults. Noise & Health, 17(78), 253-262.

[8] Alzahrani, M., Alghamdi, A., Almufarrij, A., Alzahrani, A., Alharthi, R., & Alzahrani, A. (2020). Knowledge, attitudes, and practices of university students toward hearing loss and hearing protection in Saudi Arabia. International Journal of Environmental Research and Public Health, 17(8), 2767.

[9] Nasser Y Al-Ozaib., et al. "Awareness of Ear and Hearing Health Among Young Adults". Acta Scientific Otolaryngology 4.12 (2022): 29-35.

[10] Hussain T., et al. "Early indication of noise-induced hearing loss in young adult users of personal listening devices". Annals of Otology, Rhinology and Laryngology 127.10 (2018): 703-709.

[11] Alzhrani F., et al. "Community awareness of noise-induced hearing loss from portable listening devices and possible preventive measures". Journal of Nature and Science of Medicine 3.2 (2020): 107.

[12] Rawool VW and Colligon‐Wayne LA. "Auditory lifestyles and beliefs related to hearing loss among college students in the USA". Noise Health 10 (2008): 1‐10.

[13] Alnuman N and Ghnimat T. "Awareness of Noise-Induced Hearing Loss and Use of Hearing Protection among Young Adults in Jordan". International Journal of Environmental Research and Public Health 16.16 (2019): 2961.

[14] Johnson O., et al. "British university students' attitudes towards noise-induced hearing loss caused by nightclub attendance". The Journal of Laryngology and Otology 128.1 (2014): 29-34.

[15] Di Berardino F., et al. "Public awareness of ear and hearing management as measured using a specific questionnaire". European Archives of Oto-Rhino-Laryngology 270.2 (2013):449-453.