

Does Noisy Leisure Activities Affect Hearing Health? A Survey Study

Neelesh Benet*, Jitendra Kumar Saini**, Dr. M. S. Vasanthalakshmi¹, Jesmin Aulakh² and Soumya Goel²

*(Department of ASLP, Amity University Haryana, Email: neeleshbenet12@gmail.com)

** (Department of ASLP, Amity University Haryana, Email: jitendrasaini1@gmail.com)

¹All India Institute of Speech and Hearing, Mysuru

²Students of Department of ASLP, Amity University Haryana

*First Author

**Corresponding Author

Abstract:

Noise induced hearing loss (NIHL) is accepted as one of the most common causes of hearing loss. The effect of excessive noise exposure is governed by certain factors which include the noise level, duration of exposure, frequency of sound, individual susceptibility and vulnerability due to environmental and biological factors. In India, NIHL being compensable bears a little awareness among workers but there's paucity of data regarding the impact of leisure noise activities on hearing health. The current study aims to fill this literature gap. This study aimed to identify symptoms of loud sound exposure on hearing health and to highlight the roles of hearing healthcare professionals in identification, management and prevention of hearing loss. A total of 400 participants participated in the study and were requested to fill the self-developed questionnaire. Pearson chi-square test of independence was administered to compare the responses. The findings concluded that there is a consensus among these groups regarding the fact that trained hearing healthcare workers should be at the forefront in order to bring awareness about care and maintenance of hearing health. A nationally representative sample like this warrants an immediate action by the relevant professionals and authorities to address this gap.

Keywords — Ear Pain, Hearing Loss, Loud Sound Exposure, Noise Induced Hearing Loss, NIHL, Tinnitus

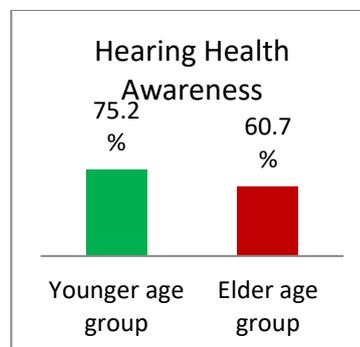
1. Introduction: Hearing loss is estimated to be the fourth leading cause of disability globally (WHO GHE, 2015) and second leading cause of disability nationally [1]. WHO estimates of 2005 put a figure of 278 million on people who have disabling hearing impairment in India. The two most common causes of hearing loss in adults are generally accepted as, the effects of ageing

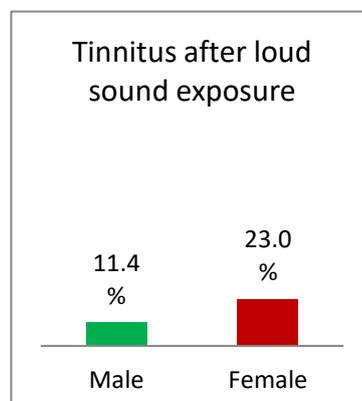
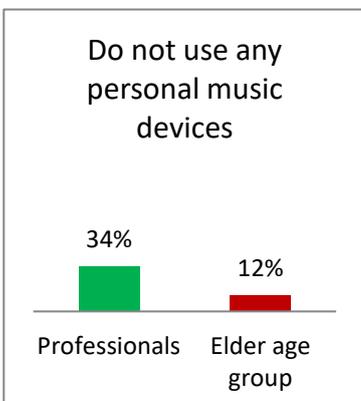
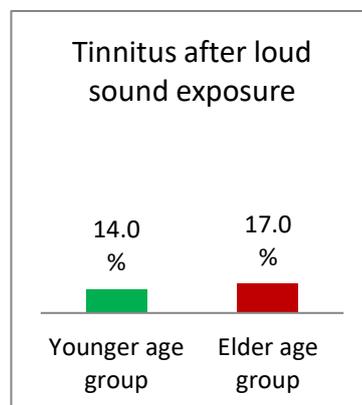
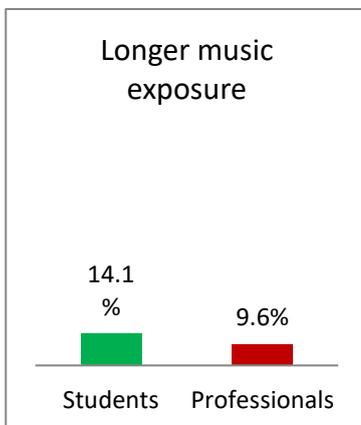
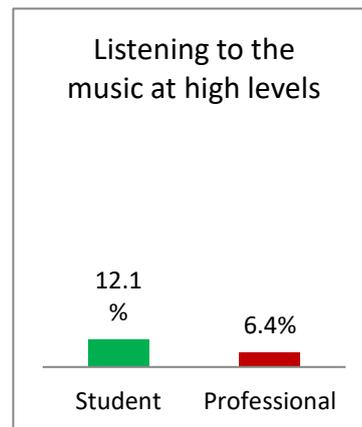
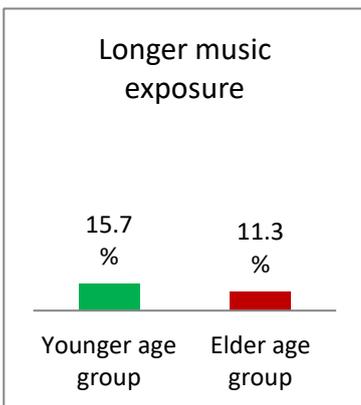
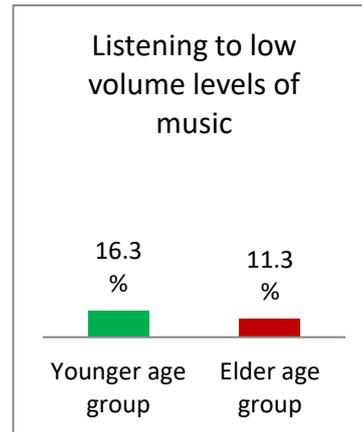
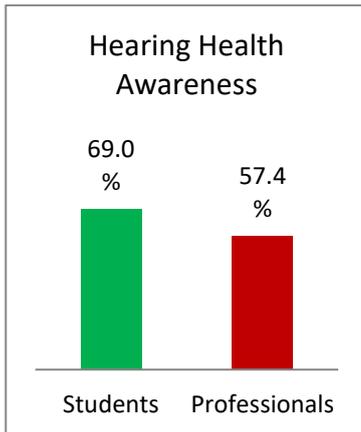
and noise induced hearing loss (NIHL). According to the WHO in 2005, occupational noise exposure is responsible for 16% of hearing loss in adults. [2]. NIHL is one of the most frequent problems among teenagers, and it has been called the "silent pandemic" since it often goes unnoticed in the non-occupational setting [3]. In the last two decades, NIHL has

become a global problem, due to the increased usage of smartphones [4]. Furthermore, as the number of smartphone users expanded, so did the use of personal listening devices (PLDs), such as earphones and headphones [5]. NIHL is a sensor neural hearing loss that starts at higher frequencies (3,000 to 6,000 Hz) and gradually worsens as a result of long-term exposure to loud noise [6]. The equivalent sound levels ranged between 75 and 105 dBA from personal music players [7]. There is also evidence that noise exposure causes tinnitus, which could be caused by changes in central auditory function [8]. Apart from noise at work, imprints of noisy leisure activities on the world of noise induced hearing loss are pervasive. In 2015, the WHO warned that 1.1 billion young people (or about 50%) were at risk of hearing loss due to personal listening devices and loud music venues where sounds may reach 120 dB for hours on end (80 dB and lower is considered safe by NIOSH). Even though these music settings may be jarring, many music listeners and musicians do not use hearing protection [9] [10]. Research suggests that personal listening devices may not be as great a concern for an adult- professional population, routine, long-term use levels are not clearly documented among younger listeners [11]. In India, NIHL being

compensable bears a little awareness among workers but there's paucity of data regarding the impact of leisure noise activities on hearing health. The current study aims to fill this literature gap and highlight some of the important aspect of prevention from NIHL.

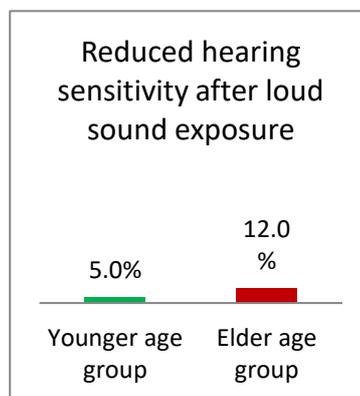
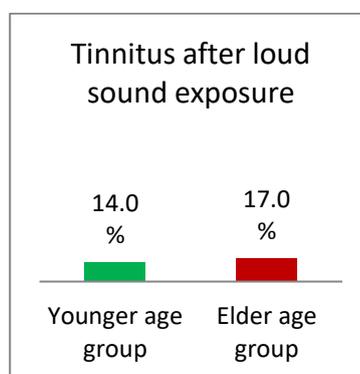
2. Method: A total of 400 participants participated in the study. The participants were categorized based on age, gender and occupation. The age group was further divided into younger (<21 years) and elder group (21+ years); Gender into male and female; Occupation into professional and students respectively. The participants were requested to fill the questionnaire. The questionnaire was validated by five audiologists. This survey was done via Google form. Pearson chi-square test of independence was administered to compare the responses of each parameter between younger and elder group; male and female; professional and students.

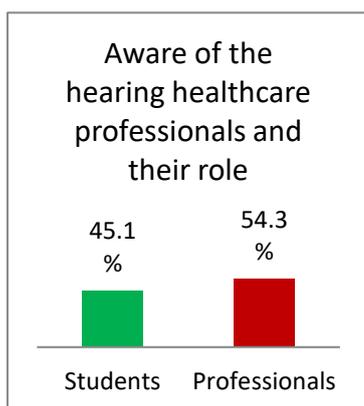
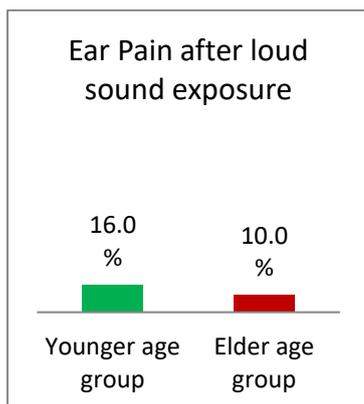




3. Results and Discussion: In view of first objective, it was observed that the younger age group (75.2%) and students (69%) showed better awareness of hearing health compared to the elder age group (60.7%) and the professionals (57.4%). This awareness can be attributed to better media exposure and improved sense of fitness in younger generation and students. Further investigation was carried out to check the duration of use of personal music devices for over 6 hours a day. It was observed that the younger age group (15.7%) and the student (14.1%) category had longer exposure than elder age group (11.3%) and the professionals' category (9.6%). It was also observed that professionals (34%) and elders (12%) do not use any personal music devices. This is because younger generation are more interested for music listening. The volume preference was also investigated across the groups. The preferred volume level for listening to music was reported to be medium by a nearly equal proportion of elder, professional, younger, and student categories. A relatively surprising 16.3% of younger category reported listening to low volume levels of music than the elder category (7.3%). Among students 12.1% reported listening to the music at high levels as compared with only 6.4% professionals who reported the same level. Despite

stating “medium level” of volume, a huge variability exists in loudness level which can cause undesired impact on hearing thresholds. According to a survey conducted by Rawool, V. W. and L. A. Colligon-Wayne in 2008, 50% of students are exposed to potentially harmful loud music, despite the fact that 75% of students appeared to be aware that loud music could cause hearing loss [12]. According to Torre III, P. in 2008, over 50% Young adults reported music listening between 1 and 3 hours and almost 90% reported listening at either a medium or loud volume. Men were significantly more likely to report listening to their system for a longer duration compared with women and more likely to report listening at a very loud volume [13].





The symptoms of loud sound exposure were studied extensively. These symptoms included tinnitus, reduced hearing and ear pain. Tinnitus was reported to be observed mostly among females (23%) than males (11.4%); elders (17%) than younger (14%) age group. The older patients seemed to be more receptive to tinnitus [14]. Tinnitus may result from central changes produced by sensory deafferentation [15]. This sensory deafferentation increases with age. Reduced hearing immediately after loud sound exposure was reported mostly by Elder (12%) than younger (5%) age group and can be attributed to the synergistic effect of aging and noise exposure. Ear pain following loud sound exposure was

reported mostly by **younger (16%) than the elder (10%)** age group. One major reason could be that the younger group mostly uses insert earphones with their personal devices. Their improved sound quality and stereo effect encourages them to wear them for hours at end causing discomfort and TTS due to increased sound output. According to a survey done by Holmes et al. on 245 participants of age group 18-27 years and it was found that over 20% of participants reported ear pain, tinnitus, and/or Temporary Threshold Shift (TTS) after noise exposure sometimes [16].

Professionals (54.3%) as well as students (45.1%) were aware of the hearing healthcare professionals and their role and involvement in providing hearing related solutions. Based on these findings it can be concluded that there is a consensus among these groups regarding the fact that trained hearing healthcare workers should be at the forefront in order to bring awareness about care, cure and maintenance of hearing health. According to the survey done in rural areas of Limpopo province of South Africa, just 14% of respondents were aware of the audiology profession, demonstrating that people in rural areas are unaware of the function of audiologists and the services they provide.[17]. Another survey of college students done by Lass et al in 1989 stated that 91.3% of the respondents knew

about hearing protective devices that are used in factories or other noisy environments, to help to prevent hearing loss [18].

4. Summary & Conclusion: The younger age group is more aware of hearing health compared to the elder age group. The younger age group had longer exposure than the elder age group. Younger generation are more interested to listen music. Students reported to be listening the music at high levels as compared to the professionals. Tinnitus was reported to be observed mostly among females than males. Reduced hearing immediately after loud sound exposure was reported mostly by elder group than younger age group. Ear pain following loud sound exposure was reported mostly by younger than the elder age group. Almost equal percentage of professionals and students were aware of the hearing healthcare professionals and their role and involvement in providing hearing related solutions.

There is a gaping void between the general awareness and the knowledge of the consequences of a hearing loss among the participants of the study. A nationally representative sample like this warrants an immediate action by the relevant professionals and authorities to address this

gap. Hearing Health Promotion Programs are recommended for this population.

References:

1. Cunningham, L.L. and D.L. Tucci, *Hearing loss in adults*. New England Journal of Medicine, 2017. **377**(25): p. 2465-2473.
2. Nelson, D.I., et al., *The global burden of occupational noise-induced hearing loss*. American journal of industrial medicine, 2005. **48**(6): p. 446-458.
3. Martin, W.H., et al., *Noise induced hearing loss in children: Preventing the silent epidemic*. Journal of Otology, 2006. **1**(1): p. 11-21.
4. Sliwinska-Kowalska, M. and A. Davis, *Noise-induced hearing loss*. Noise and Health, 2012. **14**(61): p. 274.
5. Danhauer, J.L., et al., *Survey of college students on iPod use and hearing health*. Journal of the American Academy of Audiology, 2009. **20**(01): p. 005-027.
6. Rabinowitz, P., *Noise-induced hearing loss*. American family physician, 2000. **61**(9): p. 2749-2756.
7. Serra, M.R., et al., *Recreational noise exposure and its effects on the hearing of adolescents. Part I: An interdisciplinary long-term study* *Exposición a ruido recreativo y sus efectos en la audición de los adolescentes. Parte I: un estudio interdisciplinario a largo plazo*. International journal of audiology, 2005. **44**(2): p. 65-73.
8. Henderson, D., et al., *Noise-induced hearing loss: implication for tinnitus*, in *Textbook of tinnitus*. 2011, Springer. p. 301-309.
9. Olson, A.D., et al., *Hearing health in college instrumental musicians and prevention of hearing loss*. Medical problems of performing artists, 2016. **31**(1): p. 29-36.

10. Verbeek, J.H., et al., *Interventions to prevent occupational noise-induced hearing loss: a Cochrane systematic review*. International journal of audiology, 2014. **53**(sup2): p. S84-S96.
11. Hodgetts, W.E., J.M. Rieger, and R.A. Szarko, *The effects of listening environment and earphone style on preferred listening levels of normal hearing adults using an MP3 player*. Ear and hearing, 2007. **28**(3): p. 290-297.
12. Rawool, V.W. and L.A. Colligon-Wayne, *Auditory lifestyles and beliefs related to hearing loss among college students in the USA*. Noise and Health, 2008. **10**(38): p. 1.
13. Torre III, P., *Young adults' use and output level settings of personal music systems*. Ear and hearing, 2008. **29**(5): p. 791-799.
14. Park, S.Y., et al., *Comparison of tinnitus and psychological aspects between the younger and older adult patients with tinnitus*. Auris Nasus Larynx, 2017. **44**(2): p. 147-151.
15. Noreña, A.J. and B.J. Farley, *Tinnitus-related neural activity: Theories of generation, propagation, and centralization*. Hearing Research, 2013. **295**: p. 161-171.
16. Holmes, A.E., et al., *Perceived hearing status and attitudes toward noise in young adults*. 2007.
17. Joubert, K., B. Sebothoma, and K.S. Kgare, *Public awareness of audiology, hearing and hearing health in the Limpopo Province, South Africa*. South African Journal of Communication Disorders, 2017. **64**(1): p. 1-9.
18. Lass, N., C. Woodford, and D. Everly-Myers, *A survey of college students' knowledge and awareness of hearing, hearing loss, and hearing health*. NSSLHA Journal, 1989(17): p. 90-94.