



Awareness and Attitude towards Music Induced Hearing Loss: A Survey among Young Adults of India

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Abstract

Background: The usage of smart mobile phones for streaming music has increased over the years among teenagers and young adults and some of the music listening habits may lead to increased noise exposure resulting in music induced hearing loss. The study aimed to explore the awareness and attitude of young adults towards music induced hearing loss and to determine what proportion of young adults are probably at risk for music induced hearing loss.

Methods: A survey was carried out by circulating a questionnaire through electronic media. Responses were obtained from 500 young adults, in the age range of 18 to 35 years across different states in India. The questionnaire included questions related to music listening habits and knowledge towards hearing loss caused due to music exposure. The data was analyzed using IBM SPSS version 20.0.

Results: A majority of young adults listened music through mobile phones in conjunction with headphones at medium level but a small group of young adults are probably at risk for hearing loss. Chi Square analysis revealed a significant association with age. Younger group of individuals (18 - 26 years) were more aware about music induced hearing loss than the older group individuals (27 - 35 years).

Conclusions: A small group of young adults are probably at risk for music induced hearing loss with their music listening habits and attitudes. Hence, we need to educate young adults about the safe and healthy listening behaviors.

Keywords: Music Induced Hearing Loss; Personal Music Players; Music Listening Habits

Introduction

Noise induced hearing loss (NIHL) is one of the common concerns among people with occupational noise exposure. However, other sources of noise exposure such as recreational activities (e.g. use of personal music players (PMPs)) can also affect the hearing and hearing loss occurring as a result of listening to music for at high intensity for prolonged duration of time is referred to as music induced hearing loss (MIHL). Listening to music for long du-

ration, especially by teenagers and young adults, has significantly increased in the recent years due to massive growth in technology and the music listening habits with PMPs or mobile phones can affect hearing. There are no evidence-based standards for hazardous sound levels of music standards but based on the regulations available for exposure to occupational noise, it can be inferred that equivalent sound pressure levels of more than 70 dB(A) over 24 hours can lead to hearing loss [1].

Various studies have explored the knowledge and attitude of young adults towards loud music exposure. An internet-based survey on adolescents and young adults in United states revealed that hearing health was the least concerned factor when compared with various general health matters [2]. A study towards exploration of adolescents' attitudes toward loud music associated with self-perceived difficulties and a number of psychological variables (e.g. preparedness to take risks, risk-judgment in noisy situations) revealed that self-perceived difficulties (e.g. hearing sensitivity alterations, tinnitus) were related to less tolerant attitudes toward loud music [3]. A survey of recreational noise exposure was conducted in Nigerian adults. The results revealed that a majority of their participants were listening to music on PMP's. They also reported that around 50% were listening to music at the level of loudness, which was self-assessed to be high volume [4]. It can be inferred from these studies that many young adults may be at risk for hearing loss due to their listening habits and attitudes towards MIHL.

There is a lot of concern regarding the maximum intensity levels that are delivered by these music systems, as it may have any damaging effect, if used at very high levels. All the PMPs that are used by current generation can lead to increased noise exposure in teens and young adults. Attitudes and knowledge among young adults about hearing loss caused due to over exposure to recreational noise have an influence on their listening habits. There is a need to explore the music listening habits and attitudes towards MIHL among young adults so that appropriate resource material be developed for educating young adults regarding safe listening.

Aim of the Study

The present study aimed to explore the music listening habits and awareness as well as attitude of young adults across India towards MIHL.

Methods

The research study was approved by Ethics committee of Bharati Medical college and the ethical rules of Bharati Medical college were followed. This study was conducted using a survey questionnaire. Targeted population were young adults in the age range of 18 to 35 years across different states in India. The participants included both students and working professionals from any stream of educational background. A total of 500 young adults participated in the study.

A questionnaire consisting of two parts was developed based on a review of literature. Content validation was carried out by five audiologists and five lay persons. Based on the suggestions, questions were modified and relevant questions were selected. A pilot study was carried out on 20 young adults in the age range of 18 to 35 years. The questionnaire was further modified based on the results of the pilot study. The final questionnaire consisted of a total of 42 questions. Part A included questions related to music listening behaviors in terms of level and duration they were listening to. Part B were questions related to awareness and the beliefs towards hearing loss caused due to music exposure.

The survey was carried out using Google forms (Google Inc., Mountain view, CA, USA). A google link was created and distributed among young individuals through electronic media. The link included questionnaire developed for the study along with the participant information sheet and informed consent to participate in the study. The responses were received from October 2020 to April 2021 were considered for the study. The data of only those participants who met the inclusion criteria of the study were considered for analyses.

The data were analyzed using IBM SPSS version 20.0. All the data gathered were expressed as frequency and percentages. Chi-square analysis was carried out to investigate if the age of the participants had any association with the listening habits and the self-perceived auditory symptoms. For this purpose, the participants were subdivided into two groups, Group 1 included participants in the age range of 18 to 26 years; Group 2 included participants in the age range of 27 to 35 years.

Results

A majority of young adults (90.8%) reported that they listen to music through mobile phone in conjunction with headphone. Other devices used for listening to music included personal computer (17.4%), MP3 player (14%), and I pod (5.6%). A total of 270 (56.1%) young adults preferred in the ear headphones for listening to music on their PLD. Ear buds were used by 153 (31.8%) individuals, and 86 (17.9%) individuals used supra aural headphones. Seventy-six (15.8%) reported that they used all types of headset for listening to music.

Two hundred and eighty-four (59.8%) young adults reported that they have been using PLD for more than 4 years, 111 (23.4%)

since 2 to 4 years, and 80 (16.8%) since 1 to 2 years. Nearly two thirds (61.8%) of young adults listened to music on their PLD's for less than 1 hour in a typical day. Only 40 (8.2%) respondents reported that they listened to music for more than 3 hours. One hundred and seventy-seven (37%) individuals used PLD on a daily basis in a week while 107 (22.4%) young adults listened to music on alternate days in a week. Most of the young adults 381 (76.2%) reported that they prefer to listen to music at medium volume while 76 (15.2%) and 43 (8.6%) preferred high and low volumes respectively. In noisy situations, 38.4% of young adults opted high volume while 47.4% listened at medium volume. A few (13.7%) individuals reported listening to music at low volume even in noisy situation. Two hundred and ninety-five (61.6%) young adults reported that they did not experience any kind of headache after listening to music for a long period while 69 (14.4%) individuals experienced headache followed by prolonged music listening. A majority (57.7%) of young adults reported they did not experience blockage in the ear after listening to music for a longer period while 37.3% of individuals reported that they sometimes have ear blockage after listening to music for a prolonged duration. A majority (63%) reported that they never experienced tinnitus after attending live music performance while 19.4% of individuals reported they experienced tinnitus after attending live performances. A majority of participants never experienced reduction in hearing followed by prolonged listening whereas a few (15.8%) reported reduced hearing followed by prolonged listening to music.

A majority of respondents (74.1%) reported that they never used earplugs during concerts or wedding where loud music was being played. Only 54.2% of the individuals were aware how to procure earplugs. A majority (67.1%) of respondents considered hearing loss as a big problem. They reported that they have learnt about the hazardous effect of sound on hearing during school/college and were aware that there is a risk associated with listening to music at high volume. A few individuals (32.9%) were not aware of the hazardous effects of sound on hearing during school/college. Around 46.6% of the individuals were aware that young people can have hearing loss. Only 33.1% of the participants considered hearing loss as a big problem.

Chi-square analysis was carried out to check if age was associated with young adults awareness towards music induced hearing loss. Chi-square analysis for the questions related to beliefs about the risk of hearing loss from listening through PMPs, opinion about

having hearing loss due to listening music at high volume, ear plug usage and how they treat hearing loss were probed. Results revealed that there was a significant association between age of the participants and beliefs about the risk of hearing loss from listening through PMPs, $X^2 (3, N = 500) = 26.88, p < 0.05$. There was a significant association between opinion about having hearing loss due to listening music at high volume and age, $X^2 (3, N = 500) = 38.2, p < 0.05$. More number of younger adults believed that there is more risk of acquiring hearing loss when listened at high volumes than older adults. Young adults considered hearing loss as a very big problem when compared to older participants $X^2 (4, N = 500) = 10, p < 0.05$. There was no significant relationship between participants age and usage of ear protection devices, $X^2 (2, N = 500) = 4.73, p > 0.05$.

Discussion

A majority of the respondents of the present study used mobile phones as their personal listening devices. These findings are similar to the reports of earlier studies. It was reported that 97.1% of middle school and high school students used smart phone as their personal devices [5]. Contrary to these results, Ahmed, *et al.* [6] had observed that 29.3% of university students preferred mobile phones as their listening device. A majority used MP3 players as their listening devices. The usage of MP3 players has reduced in the recent years due to advancement and high accessibility of smart mobile phones to young adults.

In this study, 59.8% of young adults reported that they have been using PLD for more than 4 years. Individuals who reported PLD usage for more than 5 years had a remarkable worsening of hearing thresholds at 4 kHz [7]. Similarly, Le prell [8] reported that individuals who used PMPs for more than 5 years had elevated hearing thresholds. Contrary to these studies, a few studies found no significant association between hearing thresholds and duration of exposure [8,11]. The difference in results could be due to the other listening habits which may interact with effect of duration of exposure. These include duration for exposure per day, intensity/loudness level at which music is played.

In the present study, a majority (61.8%) of young adults listened to music on their PLDs for less than 1 hour in a typical day. Only 40 (8.2%) respondents reported they listened to music for more than 3 hours. It can be inferred from these data that a majority of the listeners were following safe listening behaviors by limiting music

exposure. A small group of respondents reported listening music for more than 3 hours per day. However, the level at which the music is heard to is one of the factors which is to be considered. There is a tradeoff between the exposure time and the sound level, which is explained by a '3 dB exchange rule' [10]. This implies that a period of 8-hour exposure to 85 dBA have an equal amount of risk for hearing loss as a period of 4 hr of exposure to 88 dBA. Also, most of the young adults 381 (76.2%) reported that they prefer to listen to music at medium volume while 76 (15.2%) and 43 (8.6%) preferred high and low volumes respectively in quiet situations. Individuals listening levels and the duration of listening were also other critical factors in the determination of Music induced hearing loss. Thus, a majority of respondents are probably listening to music at safe audible levels. About 38.9% of respondents are probably at risk for MIHL as they reported listening music at high level in noisy situations. One of the factors which can influence the effect of music listening in this scenario is the type of headphone used. In the present study, 56.1% preferred in-the-ear headphone for listening to music on their PLDs while 27.9% individuals used supra-aural headphones. The output sound levels produced by intracranial headphones are reported to be greater in intensity when compared to supra-aural headphones. These results indicate that a majority of the participants are putting themselves at risk for MIHL.

If the subject uses a head phone which has a noise-canceling (isolator earphone) feature this could have an effect in reducing the risk of acquiring hearing loss. Nevertheless, there is a need to create awareness among young adults regarding the possible ill effect of listening to music over PLD for long duration. A majority of participants in this study never experienced any difficulties like reduced hearing, tinnitus, ear blockage in the ears following prolonged listening to music.

A majority (63%) in the present study reported that they never experienced tinnitus after attending live music performance while 19.4% of individuals reported they experienced tinnitus after attending live performances. These findings are comparable to the study done by Landalv, *et al.* [3] who reported that about 60.3% of their adolescent participants never experienced tinnitus following music exposure. On the contrary, Zocoli, *et al.* [11] explored the behaviors and attitudes of 245 teenagers in the aged between 14 to 18 years towards noise and their audiological characteristics. They reported that 69% of all his participants experienced tinnitus after attending discos and music concerts.

A majority of respondents (74.1%) in the present study reported that they never used earplugs during concerts or wedding where loud music was being played. Widen., *et al.* [9] studied the use of ear protective devices and beliefs towards noise among 258 young adults of America aged between 17 and 21 years through a questionnaire. The results revealed that none of their participants used protecting devices at discos whereas only 3% used at rock concerts. Hence the results of the present study indicate that the importance of ear plugs is not much known and there is a need to focus on educating the young individuals on these areas. The most key element to successfully educating on hearing protection devices with respect to music exposure is through attitude change [3].

A majority (67.1%) of respondents in the present study had learned about the hazardous effects of sound on hearing during school/college and around 40% seemed to be unaware of hazardous effect of loud music hence there is a need to educate young adults about the safe and healthy listening behaviors. A very few (8.3%) respondents believe that listening to music at high volume does not lead hearing loss which negatively impacts their listening habits.

Chi square analysis revealed a significant association between the age of the participants and duration of headphone use. Older individuals had listened to music greater than 4 years when compared to young individuals falling in the age range of 18 to 26 years. There was no significant association found between the participants age and preferred volume levels in quiet and noisy situations. Older group participants mostly engaged listening to music during travelling than younger ones. This suggests that older group individuals are more likely to be at risk for MIHL. Protective measures towards limiting music exposure from the Personal devices were more likely followed by younger individuals in comparison to older ones which suggests that young individuals are following safe listening behaviors and thus protect their hearing. More number of younger adults believe that there is more risk of acquiring hearing loss when listened at high volumes and considered hearing loss as a very big problem when compared to older participants. Overall, the results indicate that younger adults were more aware about the risk associated with listening to music at high volume and follow protective measures to limit the exposure than the older group individuals. Thus, the results indicate that young group are at low risk of MIHL when compared to older group participants.

Conclusion

In conclusion the results of the present study revealed that around 40% of young adults are probably unaware of hazardous effects of loud music. Hence, we need to educate young adults about the safe and healthy listening behaviors. (e.g. keeping their listening volume as low as possible, limit the time engaged in noisy activities, monitoring safe listening levels over their listening devices). This can be achieved by preparing public education material that helps to create awareness among young adults regarding music induced hearing loss and measures that can be taken to prevent the same.

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