Original Article

Effect of Earphones on Hearing Impairments Among College Going Students

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Abstract

Introduction: Loud noise can damage the hair cells. When this happens, the cochlea can't relay sound messages to the brain as well. Unlike damage to other parts of body, inner ear damage never heals. Over time, as more and more hair cells get damaged, hearing will get worse and worse. Earphones can damage the ears if they are used for a long period of time at a high volume, and can result in partial to complete hearing loss, and so on. **Aim:** The goal of this study is to determine whether using in-ear headphones affects the health of students. **Methodology:** The study includes the students of age range between 18 to 25 yrs. A random selection of 150 students participated in this purposive survey. The students answered a self- administered questionnaire about their hearing loss and earphone use habits. **Result:** According to the study's findings, 60.2% of students have hearing problems, and the most common cause is the excessive usage of in-ear headphones. Only 0.2% from control group having hearing problems.

Key words: Hearing, Impairment, Headphones, Earphones

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Introduction

A set of tiny listening devices called earphones is intended to be worn on or around the user's head over their ears. Earphones are little devices that are introduced into the outer ear and are not placed inside the ear canal. These are transportable and useful. (1)
One of the most significant issues concerning social and public health is noise-induced hearing loss (NIHL). For instance, the results of the third National Health and Nutrition Examination Survey (NHANES III) in the United States revealed that children were exposed to too much dangerous noise levels (2).
The frequency and incidence of hearing loss are very high in India. This global and Indian burden of deafness is primarily preventable and avoidable. Between 4.6% and 8.8% of people in South-East Asia are deaf. In the 58th round of the National Sample Survey, which was conducted in 2002, hearing impairment was shown to be the most significant sensory deficit and the second most frequent cause of disability in Indian families. The WHO survey has compiled a list of the principal causes of hearing loss and ear conditions in India. The most typical factor leading to reversible hearing loss was ear wax (15.9%). The second most frequent non-infectious causes of hearing impairment in India are presbycusis and aging (10.3%). Other major causes of hearing loss include middle ear infections including chronic suppurative otitis media (5.2%) and serious otitis media (3%). The other reasons are bilateral hereditary and congenital deafness (0.2%) and dry tympanic membrane perforation (0.5%). (3)
Most teenagers and young people today frequently listen to their MP3 players at maximum level, exposing them to hours of loud music on purpose. According to several studies, teenagers and young adults who use headphones have lower hearing thresholds than those who do not use them. It is alarming that portable music players and other devices that link directly to the ear, like cell phones, are becoming more and more popular since they could increase the prevalence of hearing loss in young people. (4,5)
In 2011, Ansari and colleagues conducted descriptive research in Tabriz, in the northwest of Iran, to look at how 2359 high school pupils used headphones and music players. The findings revealed that 36.8% of participants listened to music nonstop for an extended period, 49.6% of students admitted to listening to music that was "quite loud" or "extremely loud," and 44.3% of respondents said they had previously experienced hearing issues. In another descriptive study conducted in India, it was shown that 91.2% of college students wore headphones, 10.4% of them for longer than an hour each day, and 52% of them were set to a volume greater than three-quarters of their maximum output (6).

Methodology

Materials: Questionnaire (The 17-Item Hearing Loss Questionnaire), Laptop
Location and Sample: The study was conducted in the Swami Vivekananda Subharti University of Meerut. Total 150 students both male and female were chosen for the study and they all were from Swami Vivekananda Subharti University, Meerut.
Study design: Purposive study
Methodology: A survey prior to the study was conducted so that we can find out the use of different gadgets and how much time they spent on them. The sample were chosen using a purposive sampling procedure used to evaluate the results, between students of 18 to 25 years of age. A questionnaire (The 17-Item Hearing Loss Questionnaire) was used to determine whether the ear phones effect the hearing. For the study, a total of one hundred fifty (150) participants were included. The following two groups

were formed by splitting up the subjects into two groups on the basis of survey: Group A, which included 75 headphone users, served as the study group, while Group B, which included 75 non-users of headphones, functioned as the control group. A questionnaire was given out asking about sex, age, hearing problems in the past, how long people had been using headphones, what volume they preferred, and in which ear mostly they preferred to use the headphones.

Result

150 students that were chosen for the study took part and answered the questionnaire (response rate: 100%). The sample's pupils ranged from 18 to 25 years, with an average age of 21.15 (standard deviation: 3.10). 64.5% of the students were female and 35.5% were male, on average. Additionally, the findings of the survey revealed that 86.4% of the individuals had worn headphones. The majority of the participants (81.7%), laptops (10.8%), computers (4.1%), and MP3 players (3.4%) have all been used to listen to music. Regarding the uses of earbuds, 89.6% of the participants said they wore them to listen to music, 4.6% to attend lectures, 4.2% to practice their English, and 1.6% to play video games. According to the findings, earbud-style earphones were used by 51.3%, supra-aural earphones by 42.2%, and headphones by 6.5% of those who used earphones. 28% of the students said they had listened to music that was "somewhat loud" {gain set at 50%–75% or "extremely loud" (gain set at more than 75%)}. 32% of the students said that using earbuds made them queasy. The descriptive data also showed that 86 (57.3%) students never lowered the volume while listening with headphones, compared to 64(42.67%) students who did so constantly or frequently. Only 12 (8.1%) of the students who listened for an extended period of time using headphones said they took a break. In comparison to control group students, individuals who used earbuds more frequently during the week, for a
longer period of time, and more frequently overall scored higher for hearing loss. Notably, 60.2% of the students reported having hearing loss or impairment in the past. Of the overall sample, 26 students reported a history of ear disease, 42 students reported hearing loss, 28 students reported ear infection, and 54 students reported ringing in the ears and dizziness.
According to the study's findings, 60.2% of students from experimental group having hearing problems, and the most common cause is the excessive usage of in-ear headphones. Only 0.2% from control having hearing problems.

Discussion

In this study, a sample of students from SVSU were used to determine the link between earphone use and hearing loss. According to the findings, around 60% of the students had a history of ear conditions, ear infections, tinnitus, or vertigo that could have caused hearing loss or impairment. Review of Literature suggest that students in India frequently used earbuds (86.4%). According to recent research on Iranian students by Wandadi et al. [5] and on coastal South Indian students by Rekha and colleagues [8,9]. Nearly one-third of India high school students, according to another study, listen to music for longer than two hours each day. According to a study by Ansari and colleagues 44.3% of the high school pupils in Tabriz, Iran, had a history of hearing loss or injury. A number of studies from Iran and other nations have also shown that teenagers and young adults misuse earbuds by listening to loud music, wearing them nonstop, and failing to take breaks while doing so. The improper earphone usage may be a result of their ignorance about the dangers of listening to loud music. [10,11]
Improving awareness is crucial to combat the improper use of earbuds among Indian young population because there is a rising tendency in the usage of earphones and personal listening devices [12] among adolescents and youth.
Additionally, because hearing loss and temporary or permanent tinnitus are relatively common in young people and adolescents [10,13], it is important to develop environmental interventions and training programs to increase awareness of these issues among these group's[14]. However, it appears that increasing awareness alone is insufficient to change this age group's attitude and performance [15].
The frequency of listening to loud or extremely loud music differs by nation. For instance, research in Brazil and the USA estimated that 37.4% and 35% of people, respectively, listen to loud or very loud music. The subjects' ages and other sociodemographic characteristics, such as cultural differences, may have an impact on the observed differences. The findings revealed that although only 6.5% of students reported using earphones, they were more likely to use compact, portable devices like earbuds (51.3%) and supra-aural earphones (42.2%) that went straight into their ear canals. These findings agreed with those of previous research conducted in different nations [4,16]. Young people may use in-ear headphones more often because they come with personal music players or because they are less expensive than other types of earbuds [17]. In-ear headphones are still thought to carry a higher risk of hearing loss than other types of headsets [18].
In-ear headphones can significantly increase the risk of ear infection and bacterial transmission if these devices are shared. Studies have shown that those who use earphones rather than headsets prefer to listen to loud music.
Finally, the results of the ROC curve (0.706), which compares hearing loss measured by the designed questionnaire suggested to identify hearing loss. The proposed questionnaire can therefore be used in comparable research, especially in developing countries where the resources are too limited to employ other standard methods, given the relatively low cost connected with the use of the questionnaire to detect hearing loss problem. As the recent reviews suggest, in some countries, for example in Canada, hearing loss was mainly measured using self-reported data. Using the designed questionnaire to assess hearing loss may be better than using self- reported hearing loss.
This is because some studies have already demonstrated that self-reported hearing loss may underestimate hearing loss problem, especially in mild and moderate hearing loss among the youth.[20,21].

Conclusion

In conclusion, this study suggested that students have a risky pattern of using listening devices. In order to implement interventions and develop methods for

improving students' understanding and attitude about the use of personal listening devices, greater attention is needed to the higher hearing loss score among headphone users. Therefore, it is recommended that an over the ear type of headphone should be used, rather than the ear plug type and better still, a noise cancelling type of headphone should be used.

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