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KAP ABOUT EARPHONE USE AND ITS IMPACT ON HEARING AMONG MBBS STUDENTS AND RESIDENTS: A QUESTIONNAIRE-BASED CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: Personal listening device use has become universal, specially amongst students which includes medical students and residents, for both academic and recreational purposes. However prolonged and improper usage of these devices can lead to permanent hearing impairment. This study assesses the knowledge-attitude and practices pertaining to use of earphones amongst medical students and residents. **Methods:** A questionnaire based cross-sectional study was conducted among 295 medical students and residents using a structured questionnaire. Participants provided information on awareness about usage of earphones, along with their attitude towards safe-listening practices and the current practice and pattern of earphone use among the participants. **Results:** 43.05% participants were aged between 21-24 years. 96.6% were aware about hearing loss due to exposure to loud sounds. 94.9% recognized various ear symptoms like ear pain, ear block, tinnitus to be associated with earphone use. 85.76% were aware of the fact that NIHL is preventable and 87.11% expressed willingness to reduce the volume to advisable limits. But only 12.88% limited earphone use to less than 2 hours per day, 22.03% used the earphones at volume less than 70% of maximum and 57.63% took regular break from earphone use. **Conclusion:** there is a high awareness about hearing loss and its association with safe hearing practices among medical students and residents, but there exists a gap in knowledge and behavior which needs to be addressed and bridged.

KEYWORDS

earphone usage, noise-induced hearing loss , medical students, safe hearing practices

INTRODUCTION

In present era, usage of personal listening devices (PLD) has become indispensable, which apart from convenience provides ease of multitasking and mobility. These PLDs included wired and wireless earphones and headphones.

However, hearing loss (HL) has emerged as a major disability across the globe, with approximately 6.1% population suffering from some degree of hearing loss, and 12% of global population at risk of noise-induced hearing loss (NIHL), apart from the fact that the incidence of the same is expected to increase with each decade of life. Depending upon the severity of HL, it has got varying effects on the quality of life, impairs communication, along with impacting psychosocial and economic life [1-7]. The hearing loss may occur at any age but the etiologies vary. HL resulting from exposure to loud noises known as NIHL, which occurs due to damage to inner hair cells [8-10]. The exposure to sounds up to 60dB for more than 1 hour per day leads to reversible HL, whereas exposure at 85dB for at least 8 hours per day may lead to permanent HL. The source of exposure may be occupational or recreational, but in current era recreational exposure is much more common [11]. NIHL has become as major global challenge, due to increasing number of smartphone users with simultaneous increase in population exposed to PLD. Excess availability of PLDs, along with ignorance about harmful their effects, is concerning [8, 12-14].

Given the pervasive use of earphones among medical students and residents for music, lecture videos, and gaming, there is a critical need to examine their usage patterns and potential health consequences [15].

Hence, to address the above concerns, this study was conducted using a cross-sectional, questionnaire-based design to gather comprehensive data on knowledge earphone usage, awareness about the long-term effects and practices employed among medical students and residents.

MATERIALS AND METHODS

Study Design: This was a questionnaire-based cross-sectional study conducted among medical students and residents. A convenience sampling method was employed for participant recruitment, as the target population was easily accessible through digital communication platforms.

Sample Size: 295

Setting: The study was conducted at Akash Institute of Medical Sciences and Research Centre, Devanahalli, Bengaluru.

Data collection took place over three months, from March 2025 to May 2025, and the study was completed in June 2025. The recruitment process involved circulating an online questionnaire through platforms such as WhatsApp and email.

Participants: The study population consisted of medical students and residents

Inclusion Criteria:

1. Medical students currently enrolled in the MBBS and residency program
2. Individuals who had used or were currently using earphones, of either sex
3. Willing to provide informed consent were included.

Exclusion Criteria:

Students or residents with a history of significant hearing impairment unrelated to earphone usage, individuals with a history of ear surgeries, chronic ear infections, or genetic hearing disorders were excluded.

Variable: The primary variables assessed included earphone usage patterns (frequency, duration, and volume levels), demographic information (age, sex and batch), and self-reported health symptoms potentially associated with earphone use.

Collection Of Data: Participation was voluntary, and participants could withdraw at any time without repercussions. The study adhered to ethical principles, including respect for persons, beneficence, and justice.

Data were collected via a Google form questionnaire consisting of 25 structured questions. These included demographic details, specifics of earphone usage, awareness of safe earphone usage and about adverse outcomes due to prolonged headphone usage. The questionnaire was shared with all MBBS batches, from first-year students to interns and residents, ensuring broad coverage.

Bias: Efforts to minimize bias included anonymous data collection to

encourage honest responses and the use of a structured questionnaire to standardize data collection. Voluntary participation ensured that only interested and eligible individuals participated.

RESULTS

A total of 305 medical students and residents enrolled and participated in this study of which 10 participants were having self-reported pre-existing hearing loss for various causes and were excluded from the study. Remaining 295 responses were studied and evaluated.

The mean age of participants was 22.03 years, with a range of 18 to 36 years. The sex distribution included 40.68% males, and 59.32% females. Participants were distributed across the years of the MBBS course: 16.3% in their first year, 33.2% in their second year, 5.1% in their third year, 26.1% in their fourth year, 5.1% in their internship and 14.2 % were post internship as shown in Table 1.

Table 1: Sociodemographic Details Of Participants

Bio-demographic data	Frequency	Percentage
Age in years		
18-20	113	38.31
21-24	127	43.05
>24	55	18.64
Gender		
Male	120	40.68
Female	175	59.32
Year of Study		
1st	48	16.3
2nd	98	33.2
3rd	15	5.1
4th	77	26.1
Intern	15	5.1
Post Intern	42	14.2

Of all the 295 participants more than 85% participants had adequate awareness about the harmful effects of PLDs along with the awareness of hygienic listening practices. 96.6% participants were aware that listening to music at high volumes can lead to permanent HL, 94.9% participants were aware that symptoms like ear pain, blockage, or ear discharge may be associated with unsafe earphone use. 94.23% participants were aware about the WHO recommendation, advising limiting exposure to loud noises > 85dB to less than 1 hour per day. 93.22% participants were also aware of the early signs of HL which include tinnitus. 91.5% participants felt that prolonged usage of earphones can lead to ear infections. Of all the facts, participants were least aware about the fact that HL due to loud noise is preventable and usage of noise cancelling headphones can reduce the need for high volumes both at 85.65%, depicted in Table 2.

Table 2: Knowledge About PLD Usage And NIHL

Knowledge and belief about PLD usage and NIHL	n	%age
Listening to music at high volume can cause permanent hearing loss		
Yes	285	96.61
No	10	3.39
Earphones can lead to ear infections if used for prolonged periods		
Yes	275	93.22
No	20	6.78
Hearing loss due to loud sounds is preventable		
Yes	253	85.76
No	42	14.24
Tinnitus (ringing in the ears) can be an early sign of hearing damage		
Yes	275	93.22
No	20	6.78
WHO recommends listening below 85 dB for less than 60 minutes per day		
Yes	278	94.24
No	17	5.76
Use of noise-canceling headphones can reduce the need for high volume		
Yes	253	85.76
No	42	14.24
Symptoms like ear pain, blockage, or discharge may be associated with unsafe earphone use		
Yes	280	94.91
No	15	5.09

Regarding participants' attitude towards HL, most participants demonstrated a proactive attitude towards hearing preservation and prevention of hearing loss. 87.11% of participants were willing to reduce the volume of earphones to recommended levels. 85.76% of participants acknowledged the importance of taking breaks during prolonged earphone use.

83.05% of participants believed hearing evaluation should be a part of routine health checkup. 77.96% of participants were concerned about hearing loss in young adults and considered it to be a serious problem, additionally 66.1% were concerned about the effects of earphones on hearing. 55.93% of participants were willing to opt for other listening devices such as speakers.

Of all the observations, it was notable that despite being medical students and young medical graduates, 8.14% participants were reluctant to reduce the volume of earphones even when informed about long-term risks. Also 14.58% of participants willfully opted for earphones over other devices such as speakers for various purposes, including recreational.

These findings highlight a positive attitude toward hearing preservation and prevention of NIHL, but also reveal a disconnect between knowledge and behavioral change in a group of participants. This points to a gap in translating knowledge into practice, highlighting the need for population-specific strategies to bridge the gap, depicted in Table 3.

Table 3: Attitude Of Participants Towards PLD And HL

Attitude about PLD usage and HL	n	%age
Willingness to reduce earphone volume if advised		
Agree	257	87.11
Neutral	14	4.75
Disagree	3	8.14
Important to take breaks during prolonged earphone use		
Agree	253	85.76
Neutral	15	5.08
Disagree	27	9.16
Regular hearing tests should be part of routine health checkups		
Agree	245	83.05
Neutral	45	15.25
Disagree	5	1.7
Hearing loss is a serious issue in young adults		
Agree	230	77.96
Neutral	55	18.64
Disagree	10	3.4
Concerned about earphones effect on hearing		
Agree	195	66.10
Neutral	78	26.44
Disagree	22	7.46
would consider using alternatives to protect hearing.		
Agree	165	55.93
Neutral	87	29.49
Disagree	43	14.58
Belief that usage of earphones in noisy places increases the risk of hearing damage		
Agree	145	49.16
Neutral	90	30.51
Disagree	60	20.33

Regarding participants' practice towards prevention of HL, as depicted in Table 4, only 12.88% of participants restricted usage of PLDs to less than 2 hours per day, whereas 54.92% of respondents used PLDs occasionally for more than 2 hours, while 32.2% used them regularly for prolonged durations.

More than half of the participants reported listening to media at volumes more than 70% of maximum volume, of whom 55.93% listen at high volumes occasionally, while 22.03% reported using at such high volumes. Only 22.03% adhered to recommended volume levels.

64.41% of participants denied using earphones while sleeping,

whereas 30.51% agreed with the fact that they slept with earphones on occasionally. However, of the concern are the 5.08% who practiced it regularly.

Another concern is the frequency of breaks individuals take during usage of earphones. 57.63% of participants reported taking at least five-minute break every hour while using earphones, however, 37.29% did so only occasionally, whereas 5.08% never took breaks.

49.15% of respondents used earphones regularly in noisy environments such as public transport, while 37.29% did so occasionally. Only 13.56% avoided this practice altogether.

5.08% of respondents regularly reported symptoms suggestive of early hearing issues—such as ear pain, ringing, or muffled hearing following earphone use, while 50.17% of participants occasionally experienced such symptoms. Additionally, 44.75% denied any such complaints.

Only 8.47% of participants had undergone a hearing test in the past two years, while the vast majority (91.53%) had not.

Table 4: Practices Adopted By Participants For PLD

Practice about PLD usage and HL	n	%age
I use earphones for more than 2 hours per day		
Yes	95	32.20
No	38	12.88
Sometimes	162	54.92
I listen to music or media at more than 70% of maximum volume		
Yes	65	22.03
No	65	22.03
Sometimes	165	55.93
I fall asleep with earphones plugged in		
Yes	15	5.08
No	190	64.41
Sometimes	90	30.51
I take breaks (at least 5 minutes every hour) while using earphones		
Yes	170	57.63
No	15	5.08
Sometimes	110	37.29
I use earphones in noisy environments like public transport		
Yes	145	49.15
No	40	13.56
Sometimes	110	37.29
I have experienced ear pain, ringing, or muffled hearing after using earphones		
Yes	15	5.08
No	132	44.75
Sometimes	148	50.17
I have had a hearing test in the past 2 years.		
Yes	25	8.47
No	270	91.53

DISCUSSION

In this digital era, the use of PLDs has become very common, especially among young adults which includes medical students and residents. While PLDs provide convenience, their unsafe use poses a significant risk to hearing. This cross-sectional study provides valuable insights into the knowledge, attitudes, and practices related to earphone use among medical students and residents and also highlights avenues for intervention.

Our study indicates a high level of awareness among participants regarding the harmful effects of earphone usage. Over 94% of participants recognized the association between high-volume audio exposure and the risk of permanent hearing loss, which aligns with established health guidelines. Our results are consistent with the study by Zia et al., where approximately 80% of respondents were aware of NIHL, in contrast to only 18% of respondents in the study by Rekha et al. [16-17].

Despite the awareness, a gap has been noted between knowledge and practice. More than 32% of participants reported regular use of earphones for over two hours per day, and over 77% admitted to listening at volumes higher than 70% of the maximum. This behavior reflects a concerning trend that parallels findings from similar studies. Wandadi et al. reported that 10.4% of students used headphones for more than one hour per day, and 52% listened at volumes exceeding three-fourths of the maximum output. Similarly, Harshitha et al. reported that 60% of participants used earphones for more than one hour per day. These findings demonstrate that awareness alone may not lead to safer listening behaviors [18-19].

The prevalence of self-reported auditory symptoms, although lower compared to other studies, still warrants attention. Overall ontological symptoms were reported by 55.25% of participants, which is notably higher than the 23–36% tinnitus incidence found in studies by Ramya et al., and Velaro et al. This discrepancy may be due to differences in sample demographics, and listening habit. [20-21]

Poor earphone hygiene has also emerged as a contributing factor to ear-related conditions. Previous studies, including one by Thomas et al., have reported otitis externa and bacterial colonization in up to 92% of earphone users with poor aural hygiene practices. Although aural hygiene awareness was not assessed in our study, a significant proportion of participants acknowledged the risks associated with prolonged use and ear infections, reflecting their awareness of the importance of hygiene [22].

Attitude-wise, our study reflects a promising inclination amongst medical students and residents towards preventive behaviors: 87.1% were willing to reduce the volume of their devices, and 85.76% acknowledged the importance of taking breaks during periods of prolonged earphone use. However, 14.5% still preferred using earphones over speakers despite being aware of the risks, and 8.1% were unwilling to lower their listening volumes. This behavioral inertia highlights a critical disconnect that requires educational reinforcement along with targeted awareness campaigns.

Only 8.5% of participants had undergone a hearing evaluation in the past two years, underscoring the need for routine hearing evaluation in at-risk population, like young PLD users. This low testing rate, despite a high awareness of hearing loss, parallels findings from Aljuaid et al., indicating a global tendency to overlook preventive audiological care [23].

Our study contributes to the understanding of earphone use behavior among young healthcare professionals and medical students. It also emphasizes the importance of bridging the knowledge-behavior gap.

CONCLUSIONS

In conclusion, this study underscores the knowledge-behavior gap among young medical students and professionals, highlighting the need for awareness campaigns and targeted educational interventions. It also emphasizes the importance of developing public health strategies that promote safe listening practices and routine audiological screening among at-risk groups to bridge the knowledge-behavior gap and support hearing preservation.

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