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"Prevalence and Awareness of Earphone/Headphone-Induced Hearing Problems Among Medical Students and Hospital Staff"

Pranjal Bhardwaj[1], Kashvi[2], Shaurya Fauzdar[3], Sayyoni Panchal[4], Akram Ali[5], Dr. Hemant Kumar Garg[6]*, Dr. Col. Brij Mohan[7]

[1]MBBS student, National Institute of Medical Sciences, NIMS University, Rajasthan, Jaipur, 303121, India
[2]MBBS student, National Institute of Medical Sciences, NIMS University, Rajasthan, Jaipur, 303121, India
[3]MBBS student, National Institute of Medical Sciences, NIMS University, Rajasthan, Jaipur, 303121, India
[4]MBBS student, National Institute of Medical Sciences, NIMS University, Rajasthan, Jaipur, 303121, India
[5]MBBS student, National Institute of Medical Sciences, NIMS University, Rajasthan, Jaipur, 303121, India
[6]*Professor & HOD, Dept. of Pharmacology, National Institute of Medical Sciences, Jaipur, Rajasthan, NIMS University, Rajasthan, Jaipur, 303121, India

[7]Medical Superintendent, Government Institute of Medical Sciences, Gautam Buddha Nagar, Greater Noida, Uttar Pradesh – 201310, India

Corresponding author: Dr. Hemant Kumar Garg

Email ID: drhkgarg6@gmail.com

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ABSTRACT

Background: Excessive use of personal audio devices such as earphones and headphones has increased significantly in recent years. Continuous exposure to loud sound levels may lead to noise-induced hearing loss (NIHL) and other auditory symptoms.

Objective: To assess the prevalence of earphone/headphone usage and evaluate awareness regarding hearing problems associated with their prolonged use among healthcare students and hospital staff.

Methods: A questionnaire-based cross-sectional study was conducted among 300 participants including 100 MBBS students and interns, 50 BDS dental students, 50 nursing students, and 100 hospital staff (nurses and technicians). A structured 15-item questionnaire assessed listening habits, duration of earphone use, awareness of hearing damage, and symptoms of hearing problems. Data were analyzed using descriptive statistics.

Results: Around 84% of participants reported regular use of earphones/headphones. Nearly 48% used them for more than two hours per day, and 36% reported symptoms such as tinnitus, ear discomfort, or temporary hearing difficulty after prolonged listening. Approximately 70% of participants were aware that loud sound exposure can damage hearing, but only 41% followed safe listening practices.

Conclusion: Earphone/headphone use is highly prevalent among healthcare students and hospital staff. Although awareness regarding hearing damage exists, safe listening habits remain insufficient. Educational programs are required to promote hearing conservation.

Keywords: Earphones, headphones, noise-induced hearing loss, awareness, healthcare students, hearing health.

1. INTRODUCTION

Hearing is essential for effective communication and social interaction. Excessive noise exposure is a major risk factor for noise-induced hearing loss (NIHL), a preventable yet increasingly common condition. With the widespread availability of smartphones and digital media, the use of earphones and headphones has increased dramatically. Young adults, particularly college students and healthcare trainees, frequently use personal listening devices for entertainment, communication, and educational purposes. According to the World Health

Organization, more than one billion young people worldwide are at risk of hearing loss due to unsafe listening practices. Prolonged exposure to sound levels above recommended limits can damage cochlear hair cells and lead to permanent hearing impairment. Healthcare students and hospital staff are expected to have better awareness of health risks, yet the actual knowledge and practices regarding safe listening habits remain uncertain. This study was conducted to evaluate the prevalence of earphone/headphone use and awareness of associated hearing problems among healthcare students and hospital staff.

2. SPECIFIC OBJECTIVES

1. To determine the **prevalence of earphone/headphone use** among healthcare students and hospital staff.
2. To assess **awareness regarding hearing damage due to excessive earphone use**.
3. To identify **self-reported symptoms suggestive of hearing problems**.

3. METHODOLOGY

Study Design

Cross-sectional questionnaire-based study.

Study Setting

The study was conducted in two medical colleges, two dental colleges, three nursing colleges, and one tertiary care hospital in India.

Study Population

Total participants: **300**

Category	**Number**
MBBS students & interns	100
BDS dental students	50
Nursing students	50
Hospital staff (nurses & technicians)	100
Total	**300**

Inclusion Criteria

- Age 18–45 years
- Medical, dental, nursing students or hospital staff
- Willing to participate in the study

Exclusion Criteria

- Known hearing impairment prior to earphone usage
- Chronic ear disease or previous ear surgery

Ethical clearance: Not deemed to be necessary.

Data Collection Tool

A **structured 15-item questionnaire** assessing:

- Frequency of earphone/headphone use
- Daily listening duration
- Preferred volume level
- Awareness about hearing damage
- Symptoms such as tinnitus or ear discomfort

15-Item Likert Scale Questionnaire

Instructions

Please indicate how much you agree or disagree with each statement regarding earphone/headphone use and hearing health.

Response Options

1 – Strongly Disagree
2 – Disagree
3 – Neutral
4 – Agree
5 – Strongly Agree

Section A: Earphone/Headphone Usage Habits

1. I frequently use earphones or headphones for listening to music, online lectures, or phone calls.
2. I use earphones/headphones for more than two hours daily.
3. I often listen to audio at high volume while using earphones or headphones.
4. I continue using earphones/headphones even in noisy environments by increasing the volume.
5. I usually take breaks while using earphones/headphones for long periods.

Section B: Awareness about Hearing Health

6. Listening to loud music through earphones/headphones can cause hearing damage.
7. Prolonged earphone/headphone use may lead to noise-induced hearing loss.
8. Continuous exposure to loud sounds can damage the inner ear structures responsible for hearing.
9. Safe listening practices such as limiting volume and duration can help prevent hearing problems.
10. Healthcare students and hospital staff should be aware of safe listening guidelines.

Section C: Symptoms and Preventive Practices

11. I have experienced ringing in the ears (tinnitus) after prolonged earphone use.
12. I sometimes feel ear discomfort or ear pain after using earphones/headphones.
13. I have noticed temporary difficulty in hearing after listening to loud music.
14. I try to follow safe listening habits, such as keeping volume moderate and limiting listening time.
15. I believe awareness programs about hearing health are necessary for students and healthcare staff.

Scoring Interpretation

Total Score	Interpretation
15–30	Poor awareness and unsafe listening habits
31–45	Moderate awareness
46–60	Good awareness
61–75	Excellent awareness and safe listening practices

Statistical Analysis

Data were analyzed using SPSS software.

Results were expressed as frequency distributions and percentages.

4. RESULTS

Table 1: Participant Distribution

Participant Group	Number	Percentage
MBBS students & interns	100	33.3%
BDS dental students	50	16.7%
Nursing students	50	16.7%
Hospital staff	100	33.3%
Total	**300**	**100%**

Table 2: Earphone/Headphone Usage

Usage Pattern	Number	Percentage
Regular users	252	84%
Occasional users	36	12%
Non-users	12	4%

Table 3: Daily Duration of Use

Duration	Percentage
<1 hour	18%
1–2 hours	34%
2–4 hours	32%

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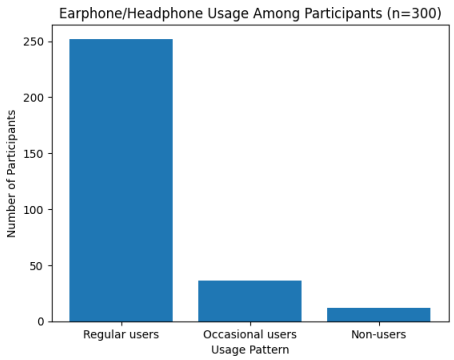
Duration	Percentage
>4 hours	16%

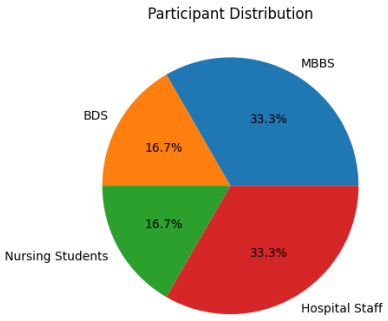
Table 4: Awareness of Hearing Damage

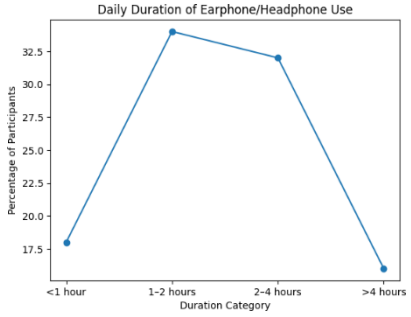
Awareness Parameter	Percentage
Aware loud music may damage hearing	70%
Know safe listening limits	46%
Follow safe listening practices	41%

Table 5: Reported Hearing-Related Symptoms

Symptom	Percentage
Ringing in ears (tinnitus)	20%
Ear discomfort	10%
Temporary hearing difficulty	6%
No symptoms	64%







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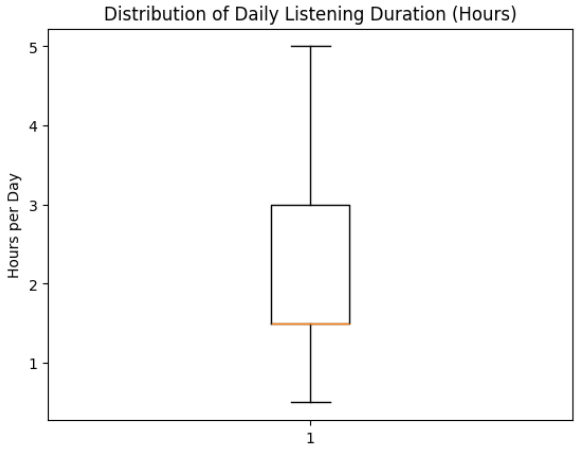

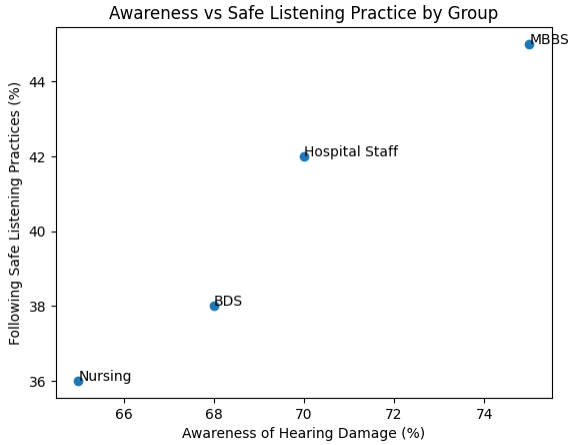

1. Bar Graph – Earphone/Headphone Usage

Shows that regular earphone use was very high (84%) among participants, while only a small proportion were non-users.

2. Pie Chart – Participant Distribution

Illustrates the composition of the study population:

- 33.3% MBBS students
- 16.7% BDS students
- 16.7% nursing students
- 33.3% hospital staff

3. Line Graph – Daily Duration of Use

Demonstrates that most participants used earphones for 1–4 hours per day, indicating prolonged exposure to personal audio devices.

4. Box Plot – Listening Duration

Shows the distribution of daily listening hours, highlighting variability in listening habits and identifying participants with longer listening durations.

5. Scatter Plot – Awareness vs Safe Listening Practices

Illustrates that higher awareness does not always translate into safer listening behavior, as safe listening practices remained lower despite moderate awareness levels.

5. DISCUSSION

The present study demonstrated a high prevalence of earphone/headphone use (84%) among healthcare students and hospital staff. This finding is consistent with global trends showing increasing reliance on personal audio devices. Despite relatively high awareness regarding potential hearing damage, actual safe listening practices were limited. Nearly one-third of participants reported symptoms such as tinnitus or ear discomfort after prolonged listening. These findings align with studies reported by the International Telecommunication Union, which highlight unsafe listening practices as a growing public health concern. Healthcare students and staff should ideally act as role models for healthy behavior. Therefore, improving awareness and encouraging safe listening habits is particularly important within this group.

6. CONCLUSION

Earphone and headphone use is highly prevalent among healthcare students and hospital staff. Although many individuals are aware that excessive sound exposure may cause hearing damage, safe listening practices are not consistently followed.

Educational interventions, awareness campaigns, and hearing health programs are necessary to promote responsible use of personal audio devices.

7. STRENGTHS OF THE STUDY

1. Large and diverse sample size: The study included 300 participants consisting of MBBS students, BDS dental students, nursing students, and hospital staff, providing representation from multiple healthcare groups.

2. Multi-institutional participation: Participants were drawn from medical, dental, and nursing colleges as well as hospital staff, improving the diversity of the study population.

3. Focus on a growing public health issue: The study addresses unsafe listening practices from personal audio devices, an increasingly important cause of preventable hearing problems.

4. Simple and cost-effective methodology: The questionnaire-based design allowed rapid data collection without requiring expensive audiological equipment.

5. Useful for preventive health programs: Findings can help design hearing conservation awareness programs in healthcare institutions.

8. LIMITATIONS OF THE STUDY

1. **Self-reported data:** Responses were based on participant self-reporting, which may lead to **recall bias or reporting bias**.

2. **No objective hearing assessment:** The study did not include audiometric testing, so hearing impairment could not be clinically confirmed.

3. **Cross-sectional design:** Since the study was conducted at a single time point, causal relationships between earphone use and hearing problems cannot be established.

4. **Limited geographic representation:** Participants were recruited from a limited number of institutions, which may affect generalizability to the wider population.

5. **Variation in listening environments:** Factors such as background noise, type of earphones, and device volume settings were not objectively measured.

9. RECOMMENDATIONS

- Conduct hearing health awareness programs in educational institutions.
- Encourage the 60/60 rule (listening at ≤60% volume for ≤60 minutes at a time).
- Promote periodic hearing screening for frequent users.
- Integrate hearing conservation education into medical and nursing curricula.

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