

A Descriptive Study to Assess the Knowledge, Attitude and Practice Regarding the Ill Effects of Prolonged Use of In-Ear Audio Devices among BSc Nursing Students in A Selected College, Kozhikode

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ABSTRACT

Hearing loss, particularly due to noise exposure is a growing public health concern, especially among young adults. The widespread use of personal audio devices at high volume levels has been linked to noise-induced hearing loss (NIHL). The present study aims to assess the knowledge, attitude, and practice (KAP) regarding the ill-effects of prolonged use of in-ear audio devices among BSc. nursing students in a selected college at Kozhikode.

The objectives of the study were: to assess the knowledge of nursing students on the ill effects of prolonged usage of in-ear audio devices, to assess the attitude of nursing students towards the prolonged use of in-ear audio devices, to assess the practice of prolonged usage of in-ear audio devices, to find out the association between knowledge, attitude and practice with demographic variables. The conceptual framework was based on Health Belief Model. The tools used included socio-demographic performa, self-structured knowledge questionnaire, attitude rating scale and practice checklist.

A pilot study was conducted, followed by data collection among 270 BSc nursing students. The data collected were tabulated and analysed. The findings showed, 42% (113 students) have good knowledge, 51% (139 students) have adequate knowledge, 7% (18 students) have poor knowledge. 50% (136 students) have good attitude, 50% (134 students) have average attitude. 58% (156 students) have good level of practice, 40% (107 students) have average level of practice, 2% (7 students) have poor level of practice. The study emphasizes the importance of health education and awareness programs regarding the safe use of audio devices.

Key words: Knowledge, attitude, practice, in-ear audio devices, ill-effects, prolonged earphone use.

INTRODUCTION

Background of Study

In recent years, the use of in-ear audio devices such as earphones and earbuds has significantly increased, especially among young adults. While these devices provide convenience and privacy, their prolonged use at high volumes raises concern about hearing impairment. Despite the growing prevalence of hearing loss among headphone users, many remain unaware of the risks of sustained exposure to loud audio levels.

This study investigates the knowledge, attitude, and practice of BSc. Nursing students regarding these risks, as future healthcare professionals must be informed and cautious in their personal and professional lives.

The indicators used to assess knowledge, attitude and practice regarding the ill effects of prolonged use of in-ear audio devices were classified into knowledge, attitude, and practice indicators. The knowledge indicators include awareness of health hazards, understanding of safe listening practices, and knowledge of potential risks. The attitude indicators include perceptions about hearing health, beliefs about risks, and feelings towards reducing usage. The practice indicators include frequency and duration of use, volume levels, and hygiene habits.

The determinants of preventive, promotive, palliative, and rehabilitative care were assessed in the study, including knowledge of safe listening practices, attitude towards hearing health, use of protective measures, access to healthcare, and audiology services. These determinants play a crucial role in promoting hearing health among BSc Nursing students, highlighting the need for targeted interventions to improve knowledge, attitude, and access to care.

Problem Statement

“A descriptive study to assess the knowledge, attitude and practice regarding the ill-effects of prolonged use of in-ear audio devices among BSc Nursing students in a selected college, Kozhikode”.

Objectives

1. To assess the knowledge of nursing students on the ill effects of prolonged usage of in-ear audio devices.
2. To assess the attitude of nursing students towards the prolonged use of in-ear audio devices.
3. To assess the practice of prolonged usage of in-ear audio devices.
4. To find out the association between knowledge, attitude and practice with demographic variables.

Justification

Research on headphone usage habits, auditory health, and their association with hearing loss is crucial due to the increasing concerns about potential impacts on individuals' auditory health, especially among younger populations. There is a lack of awareness regarding safe listening levels and practices, necessitating education campaigns.

Understanding the relation between headphone use and hearing loss helps to develop preventive measures and public health implications, addressing a significant research gap in bridging behaviours and patterns of headphone usage with hearing acuity for targeted intervention groups.

By elucidating the complex dynamics between headphone exposure and auditory function, this research contributes to advancing our knowledge of the potential risks associated with modern audio practices, thereby fostering informed decision making and proactive measures to protect and preserve hearing well-being among students.

The widespread use of personal audio devices has been linked to noise-induced hearing loss (NIHL), a growing public health concern. Many students remain unaware of the risks of sustained exposure to loud audio levels, highlighting the need for education and intervention.

Research Questions

1. What is the level of knowledge regarding the ill effects of prolonged use of in-ear audio devices among BSc Nursing students?
2. What is the attitude of BSc Nursing students towards the use of in-ear audio devices?
3. What are the practices of BSc Nursing students regarding the use of in-ear audio devices?

Hypothesis

H1: There is a significant association between the selected demographic variables and the knowledge, attitude and practice regarding the ill effects of prolonged use of in-ear audio devices among BSc Nursing students.

Operational Definition

Knowledge - Refers to the awareness and understanding of BSc nursing students regarding the health hazards associated with prolonged use of in-ear audio devices.

Attitude - Refers to the feelings, beliefs and perceptions of BSc nursing students about the use and potential risks of in-ear audio devices.

Practice - Refers to the actual usage behaviour of in-ear audio devices by BSc nursing students, including frequency, volume level, duration and hygienic habits.

Prolonged Use - Refers to the continuous use of in-ear audio devices beyond the recommended safe listening durations, typically more than 60 minutes per day at high volume (>60% of maximum volume), as per WHO standards.

In-ear Audio Devices - Refers to electronic devices that are inserted into or rest just outside the ear canal for listening to audio. eg: Wired earphones, Bluetooth earbuds, noise-cancelling headphones.

METHODOLOGY

- Research approach: Quantitative approach
- Research design: Descriptive design
- Population: BSc nursing students of a selected college in Kozhikode
- Setting of study: The study was conducted among nursing students who are studying BSc nursing in KMCT College of Nursing.
- Method of data collection: Survey
- Data collection: Data collection was started after obtaining clearance from ethics committee and permission from ethical authorities at KMCT College of Nursing. The subjects were selected by convenient sampling. Informed consent was obtained from the subjects. Data was collected using a self- structured questionnaire which includes knowledge questionnaire, attitude rating scale and practice checklist. The data collected from 270 BSc nursing students were tabulated and analyzed.
- Data collection tool: Self- structured questionnaire
- Tool description:

Section A: Demographic data

It consists of 8 questions to collect age, gender, year of study, duration of in-ear audio device use, type of in-ear audio device used, preferred volume level, average daily listening time.

Section B: Knowledge questionnaire

It consists of 15 questions to assess the knowledge of students regarding ill effects of prolonged use of in-ear audio devices.

Section C: Attitude scale

It consists of 15 questions to assess the attitude of students regarding the ill-effects of prolonged use of in-ear audio devices.

Section D: Practice checklist

It consists of 15 questions to assess the practice of students regarding the ill-effects of prolonged use of in-ear audio devices.

- Sample size: 270
- Sampling technique: Convenient sampling technique.
- Sampling criteria:

Inclusion criteria:

1. BSc nursing students who are currently enrolled in KMCT College of Nursing.
2. Students who use in-ear audio devices (e.g., earphones, earbuds)
3. Students who are willing to participate in the study.
4. Students who are available during the data collection period.

Exclusion criteria:

1. Students with known hearing impairments or pre-existing ear disorders (e.g., chronic otitis media, congenital hearing loss).
2. Students who do not use audio devices at all.
3. Students who are absent or unavailable during the time of data collection.
4. Students who refuse to give informed consent.

Variables

Dependent Variable: Knowledge, attitude, practice regarding ill-effects of prolonged use of in-ear audio devices.

Independent variable: Age, gender, year of study, duration of in-ear audio device use, type of in-ear audio device used, preferred volume level, average daily listening time.

Ethical Consideration

The research proposal was presented in front of research committee of KMCT College of Nursing and approval was obtained. Ethical clearance for the study was obtained from KMCT ethics committee. Informed consent was obtained from the subjects.

Presentation of Data

Results

According to the study, the results showed, 42% (113 students) have good knowledge, 51% (139 students) have adequate knowledge, 7% (18 students) have poor knowledge. 50% (136 students) have good attitude, 50% (134 students) have average attitude. 58% (156 students) have good level of practice, 40% (107 students) have average level of practice, 2% (7 students) have poor level of practice. The association was found between knowledge

and gender ($P = 5.42941 \times 10^{-6}$), knowledge and type of device ($p=0.0133$), knowledge and volume level used ($p=0.0124$), attitude and gender ($p= 0.0207$), practice and gender ($p=0.0105$), practice and daily duration of use ($p=8.1712 \times 10^{-6}$), practice and volume level used ($p= 0.0032$).

Section 1

| DEMOGRAPGIC VARIABLES | FREQUENCY | PERCENTAGE |
|--|-----------|------------|
| AGE | | |
| 18-20 years | 131 | 48.5% |
| 21-23 years | 134 | 49.6% |
| 24-26 years | 5 | 1.9% |
| SEX | | |
| Male | 68 | 25.5% |
| Female | 202 | 74.8% |
| YEAR OF STUDY | | |
| 2 nd semester | 81 | 30% |
| 4 th semester | 80 | 29.6% |
| 6 th semester | 53 | 19.6% |
| 7 th semester | 56 | 20.7% |
| AVERAGE DAILY DURATION OF USE PER DAY | | |
| Less than 1 hour | 114 | 42.2% |
| 1-2 hours | 109 | 40.4% |
| 3-4 hours | 36 | 13.3% |
| More than 4 hours | 11 | 4.1% |
| TYPE OF DEVICE USED | | |
| Wired earphones | 61 | 22.6% |
| Wireless earbuds | 185 | 68.5% |
| Headphones | 24 | 8.9% |
| VOLUME LEVEL USUALLY USED | | |
| Low | 39 | 14.4% |
| Medium | 199 | 73.7% |
| High | 32 | 11.9% |
| USING IN- EAR AUDIO DEVICES WHILE | | |

| | | |
|------------|-----|-------|
| Studying | 15 | 5.6% |
| Traveling | 158 | 58.5% |
| Sleeping | 21 | 7.8% |
| Exercising | 7 | 2.6% |
| Others | 69 | 25.6% |

Table 4.1. Frequency (percentage) distribution of socio demographic characteristics of the sample

DISCUSSION

The present study was supported by similar study done by Shubhangi Borude, Vanshika Paduvil, Ganesh Jadhav, Komal Kelakar in 2024 on ‘Knowledge regarding harmful effects of continuous use of earphones among the teenagers’ residing in selected areas of Pune city, India. The research approach for the study is Quantitative approach and the research design is non - experimental, descriptive research design. 200 teenagers were selected for the study from selected areas and of Pune by using non - probability purposive sampling technique. The study revealed that among 200 samples more than half percentage of the teenagers (62%) are having average knowledge, whereas (38%) teenagers have good knowledge and (0%) have poor knowledge. That is the knowledge regarding harmful effects of continuous use of ear phones among teenagers of the study is 62%.

Nursing Implications

Nursing Practice

The study highlights the need for integrating preventive audiology practices into routine nursing care. Nurses, being key health educators, can take an active role in promoting safe listening habits among students through health education sessions, awareness programs, and by incorporating informational leaflets into clinical practice.

Nursing Administration

The results indicate the need for policy-level interventions within nursing institutions. Nurse administrators can use these findings to implement and support hearing health programs and awareness campaigns within the college. They can also facilitate workshops, distribute educational materials, and update institutional guidelines on safe technology use among students, in collaboration with other departments.

Nursing Education

Nurse educators should enhance their teaching strategies by incorporating modules on noise-induced hearing loss and safe listening habits. This topic can be integrated into community health nursing and ENT nursing curricula, allowing students to educate peers and the community during clinical postings and health talks.

Nursing Research

This study opens avenues for further research in the field of audiological health and behavioural practices among youth. Future research can focus on evaluating the effectiveness of interventions like educational modules, mobile apps for safe listening, and peer-led awareness programs to improve knowledge, attitude, and practice related to in-ear device usage.

Limitations

- Use of self-structured questionnaire: The study relied on self-structured questionnaire, which may have been influenced by social desirability bias or inaccurate recall.

- Limited generalizability: The sample may not represent the entire population, especially if restricted to a specific region, age group, or educational background.
- Technological variations: The study did not differentiate between types, brands, or quality of in-ear audio devices, which may influence health impacts.
- Lack of clinical correlation: No audiometric or medical examination was conducted to correlate reported usage with actual hearing health.
- Unaccounted confounders: Environmental factors, occupational noise exposure, and pre-existing hearing issues were not controlled for.

RECOMMENDATIONS

On the basis of the findings of the study, the following recommendations have been made;

- Similar study can be replicated on a large sample to validate and generalize the study findings.
- Conduct longitudinal studies to assess long-term effects of in-ear audio device usage.
- Include clinical audiological assessments to better correlate usage patterns with hearing loss.
- Expand study populations to include varied age groups and occupational backgrounds.

Summary

This study assessed the knowledge, attitude, and practice regarding the ill-effects of prolonged in-ear audio device use among 270 BSc Nursing students at KMCT College of Nursing using a descriptive, non-experimental design. Findings revealed that 42% had good knowledge, 50% had a positive attitude, and 58% practiced safe usage, with significant associations between demographic factors (gender, device type, usage duration, volume levels) and outcomes. The study concluded that while many students demonstrate awareness, gaps remain, necessitating targeted interventions. Nursing implications include integrating preventive audiology into education, clinical practice, and institutional policies, while recommendations highlight the need for larger studies, longitudinal research, clinical audiological assessments, and broader population inclusion. Limitations include potential response bias, restricted generalizability, and lack of clinical hearing data. Overall, the findings emphasize the importance of promoting safe listening habits to mitigate auditory health risks among students.

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APPENDIX I

Organization of Study Findings

Section 1 Analysis of knowledge level of students regarding the ill-effects of prolonged use of earphones.

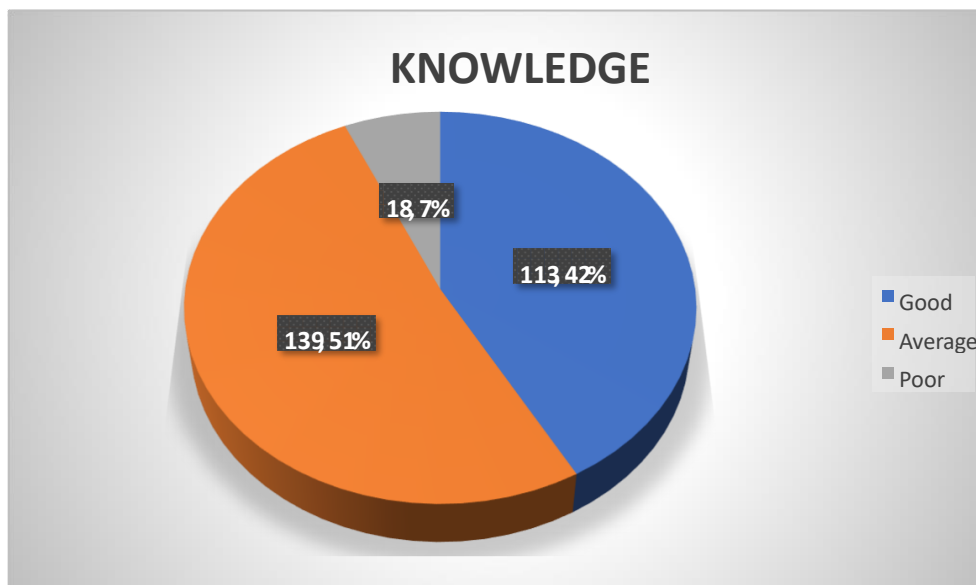


Figure 4.1 shows that 18 members have poor, 139 members have average and 113 members have good knowledge respectively.

Section 2 Analysis of attitude of students regarding the ill-effects of prolonged use of earphones.

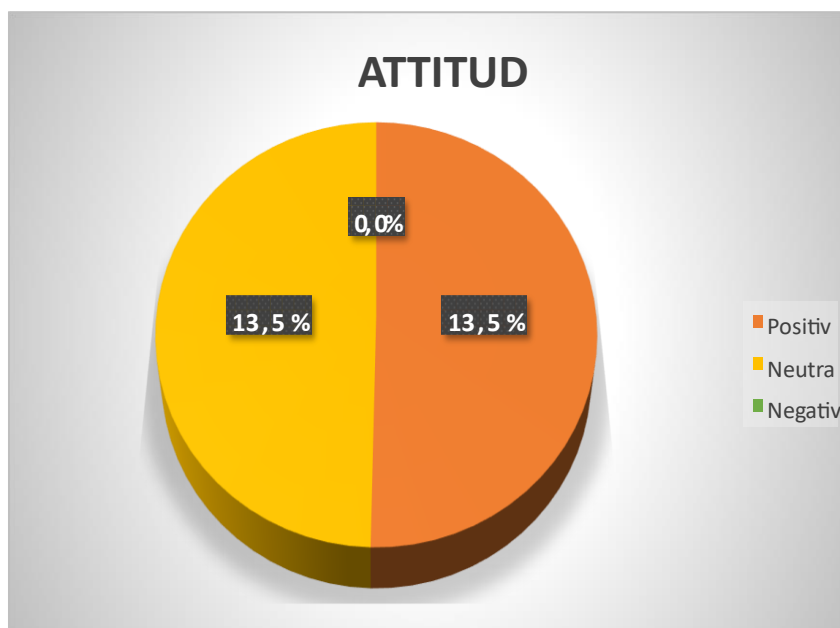


Figure 4.2 shows that 0 had negative, 134 had neutral and 136 had positive attitude respectively.

Section 3 Analysis of level of practice of students regarding the ill-effects of prolonged use of earphones.

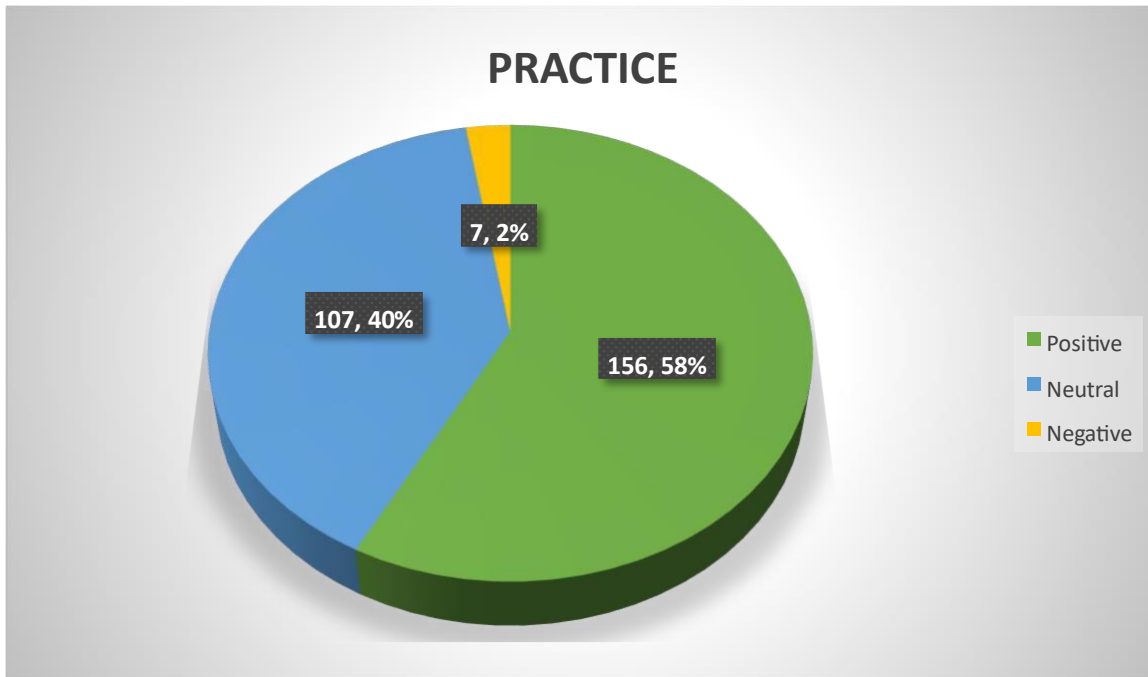


Figure 4.3 shows that 7 students have negative, 107 have neutral and 156 have positive practice respectively.

APPENDIX II

Data Collection Tool

Self-Structured Questionnaire

Problem statement: A descriptive study to assess the knowledge, attitude and practice regarding the ill-effects of prolonged use of in-ear audio devices among BSc. nursing students in a selected college, Kozhikode.

Section A: Demographic Proforma

(Tick ✓ the appropriate option)

1. Gender:

Male Female Prefer not to say

2. Age:

18-20 years 21-23 years 24-26 years

3. Year of Study

2nd sem

4th sem

6th sem 7th sem

4. Do you use in-ear audio devices (e.g., earphones, earbuds)?

Yes

No

5. Average daily duration of use:

<1 hour

1–2 hours 3–4 hours >4 hours

6. Type of device used:

Wired Earphones Wireless ear buds Headphones

7. Volume level usually used:

Low Medium High

8. Do you use in-ear devices while (tick all that apply):

Studying Traveling Sleeping Exercising Other: _____

Section B: Knowledge Questionnaire

(Choose the correct answer)

1. What is the safe volume level for listening through earphones?

A) 40% of the maximum volume

B) 60% of the maximum volume

C) 80% of the maximum volume

D) I don't know

2. What is the recommended maximum time of earphone use at safest volume?

A) 1 hour

B) 2 hour

C) 3 hour

D) I don't know

3. Which part of the ear is most affected by prolonged use of in-ear audio devices?

A) Outer ear

B) Middle ear

C) Inner ear (cochlea)

D) Ear canal

4. What are the potential health risks associated with prolonged earphone use?

A) Hearing loss only

- B) Ear infections only
- C) Hearing loss, ear infections, and tinnitus
- D) All of the above
5. How often should earphones be cleaned?
- A) Weekly
- B) Daily
- C) Monthly
- D) Rarely
6. What is the purpose of noise-cancelling earphones?
- A) To increase volume
- B) To reduce ambient noise
- C) To improve sound quality
- D) To add bass
7. Does sharing earphones with others lead to health problem
- A) No
- B) Yes
- C) Only if proper hygiene is maintained
- D) Only if you have an infection
8. What are the symptoms of hearing loss caused by earphone use?
- A) Ringing, buzzing, or difficulty hearing
- B) Ear pain or discomfort
- C) Itching or redness
- D) All of the above
9. How often should you take breaks when using earphone?
- A) Never
- B) Only when your ear starts hurting
- C) Every 60 minutes
- D) No need to take break if the volume is low
10. What is the minimum age limit for using earphones?

- A) 5 years old
 - B) 12 years old
 - C) 18 years old
 - D) 10 years old
11. What is a common problem caused by sharing earphones?
- A) Reduced sound quality
 - B) Ear infections
 - C) Hearing enhancement
 - D) No health risk
12. What is tinnitus?
- A) An ear infection
 - B) Ringing sound in the ear
 - C) A type of earphone
 - D) Ear-wax build up
13. Which of the following is a good habit when using earphones?
- A) Sharing earphones with others without cleaning
 - B) Cleaning your earphones regularly
 - C) Keeping earphones in your ear all day
 - D) Listening at high volume
14. Does excessive earphone use lead to tinnitus?
- A) Yes
 - B) No
 - C) Only if you share earphones with others
 - D) Only if you have a pre-existing condition
15. Which sign suggests that your earphone volume is too high?
- A) You feel sleepy when listening
 - B) Your ear feels warm after use
 - C) You hear a ringing sound after removing the earphone
 - D) Your earphones stop working

Scoring system:

No. of questions- 15

Correct answer-1 point

Incorrect answer-0 point

Total possible score- 15

Score interpretation:

11-15 - Good knowledge

6 -10 - Adequate knowledge

0 -5 - Poor knowledge

Section C: Attitude Scale

(Tick the appropriate option)

SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree

| No. | Statement | SA | A | N | D | SD |
|-----|---|----|---|---|---|----|
| 1. | I believe in-ear devices are harmful if used for long hours. | | | | | |
| 2. | It is okay to listen at high volume as long as it is not frequent. | | | | | |
| 3. | Using earphones while sleeping is harmless. | | | | | |
| 4. | I feel it is necessary to consult a doctor if I experience ringing in my ear after using earphones. | | | | | |
| 5. | Teenagers are more at risk of hearing damage from earphones than adults. | | | | | |
| 6. | I think taking breaks while using earphones is unnecessary. | | | | | |
| 7. | I think it is okay to share earphones with others. | | | | | |
| 8. | I prefer listening through earphones at high volumes. | | | | | |
| 9. | I feel confident I can reduce my earphone use if needed. | | | | | |
| 10. | I believe ear pain caused by earphones is just temporary and harmless. | | | | | |
| 11. | It is necessary to clean earphones regularly. | | | | | |
| 12. | I feel annoyed when someone asks me to lower the volume of my earphones. | | | | | |
| 13. | The convenience of earphones outweighs any possible health risks. | | | | | |
| 14. | I believe noise-cancelling earphones are safer than regular earphones. | | | | | |
| 15. | I believe protecting my hearing is more important than listening to loud music. | | | | | |

Scoring system:

Number of positive statements- 7

Number of negative statements- 8

Total number of statements- 15

For positive statements,

Strongly agree (SA)- 5

Agree (A)- 4

Neutral (N)- 3

Disagree (D)- 2

Strongly disagree (SD)- 1

For negative statements,

Strongly agree (SA)- 1

Agree (A)- 2

Neutral (N)- 3

Disagree (D)- 4

Strongly disagree (SD)- 5

Total score range

Minimum score- 15 (15×1)

Maximum score- 75 (15×5)

Score interpretation:

56-75 – Positive attitude

36-55 – Neutral attitude

15-35 – Negative attitude

Section D: Practice Checklist

(Choose yes or no)

1. I clean my earphones regularly.

YES NO

2. I limit the volume to safe levels.

YES NO

3. I use earphones for more than 2 hours a day.

YES NO

4. I share my earphones with others.

YES NO

5. I use earphones while sleeping.

YES NO

6. I take regular breaks while using earphones.

YES NO

7. I've experienced symptoms like ear pain or ringing in the ears while using earphones.

YES NO

8. I've consulted a doctor for ear-related problems.

YES NO

9. I use earphones in noisy environments.

YES NO

10. I avoid using earphones when exercising.

YES NO

11. I clean my ears regularly.

YES NO

12. I've noticed hearing loss or difficulty hearing.

YES NO

13. I use earphones with noise-cancelling features.

YES NO

14. I've received warnings about my earphone use from others.

YES NO

15. I am aware of volume warning alerts on my device and I reduce the volume when notified.

YES NO

Scoring system:

Number of positive statements- 10

Number of negative statements- 5

Total number of statements- 15

Positive statements- YES- 1 point, NO- 0 point

Negative statements- NO- 1 point, YES- 0 point

Total score- 15

Score interpretation:

11-15 – Positive practice

6-10 – Neutral practice

0-5 – Negative practice

APPENDIX III

Answer Key

Knowledge Questionnaire

1. 60% of the maximum volume
2. 1 hour
3. Inner ear (cochlea)
4. All of the above
5. Cleaning your earphones regularly
6. Weekly
7. To reduce ambient noise
8. Yes
9. All of the above
10. Every 60 minutes
11. 12 years
12. Ear infections
13. Ringing sound in the ear
14. Yes
15. You hear a ringing sound after removing the earphones

Attitude Scale

1. Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree

2. Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
3. Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
4. Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
5. Strongly agree, Agree, Neutral, Disagree, Strongly Disagree
6. Strongly disagree, Disagree, Neutral, Agree, Strongly Agree
7. Strongly disagree, Disagree, Neutral, Agree, Strongly Agree
8. Strongly disagree, Disagree, Neutral, Agree, Strongly Agree
9. Strongly agree, Agree, Neutral, Disagree, Strongly Disagree
10. Strongly disagree, Disagree, Neutral, Agree, Strongly Agree
11. Strongly agree, Agree, Neutral, Disagree, Strongly Disagree
12. Strongly disagree, Disagree, Neutral, Agree, Strongly Agree
13. Strongly disagree, Disagree, Neutral, Agree, Strongly Agree
14. Strongly agree, Agree, Neutral, Disagree, Strongly Disagree
15. Strongly agree, Agree, Neutral, Disagree, Strongly Disagree

Practice Questionnaire

1. Yes
2. Yes
3. No
4. No
5. No
6. Yes
7. Yes
8. Yes
9. No
10. Yes
11. Yes
12. Yes
13. Yes
14. No
15. Yes