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Awareness of the Health Consequences of Prolonged Ear/Headphones Usage Among Undergraduate Students in Abia State University, Uturu, Nigeria

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Abstract

Introduction: The increasing use of earphones and headphones among university students has raised public health concerns, particularly regarding prolonged exposure to sound and the potential for noise-induced hearing loss (NIHL). This study assessed the level of awareness, preventive practices, health issues experienced, and associated factors among undergraduate students in Abia State University, Uturu, with respect to prolonged earphone and headphone usage.

Methods: A descriptive cross-sectional study design was employed involving a sample of undergraduates selected using stratified random sampling. Data were collected using a structured, self-administered questionnaire and analysed using descriptive and inferential statistics. Associations between awareness, practices, and health outcomes were tested using chi-square analysis at a 5% significance level.

Results: Awareness of health hazards was moderate (63.0%). Preventive actions include lowering volume (79.8%), restricting time of use (65.0%), and taking listening breaks (84.0%). Commonly reported health issues included ear pain (26.3%), headaches (19.5%), sleeping difficulty (12.0%), ear infection (11.3%), tinnitus (5.3%) and others. Gender, frequency of use, and duration per session were significantly associated with both awareness levels and health complications ($P<0.05$).

Conclusion: Despite knowledge of potential risks, preventive behaviour was inconsistent. Targeted health education campaigns and periodic auditory screenings are recommended to mitigate the long-term risks of unsafe listening habits.

Keywords: Noise-induced hearing loss, Earphones, Headphones, Health knowledge, Attitudes, Practice, Students, Auditory perception

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Introduction

Headphones and earphones, commonly referred to as personal listening devices (PLDs), are electronic audio output devices worn over or inside the ears to transmit sound from a source such as a smartphone, laptop, or music player. While they provide convenience for communication, education, and entertainment, prolonged and excessive use, especially at high volumes, poses significant health risks, particularly to auditory and neurological well-being.[1] Noise-Induced Hearing Loss (NIHL), tinnitus, ear infections, and increased stress levels are among the documented consequences of excessive headphone usage[2]

Globally, the use of personal audio devices has risen dramatically, particularly among young people. The WHO estimates that over 1.1 billion individuals aged 12–35 are at risk of hearing loss due to unsafe listening practices, with approximately 50% of them exposed to harmful noise levels through PLDs. Studies show that unsafe listening can cause damage throughout the course of a person's life, and early exposure to noise may increase a person's risk of developing age-related hearing loss.[3,4] Significantly, untreated hearing loss has significant negative effects on people and families and is expected to cost the economy almost $1 trillion a year.[5] While hearing loss in adults has been linked to poorer psychosocial well-being, lower income, and serious comorbid health conditions like cognitive impairment,[6] hearing loss and/or noise exposure in children has been linked to worse academic performance as well as decreased motivation and concentration.[7] Another study found that 70% of university students reported regular use of headphones, with nearly 45% exceeding the recommended safe listening limit of 60% volume for no more than one hour per day.[8] Similarly, research conducted in India revealed that 65% of young adults reported experiencing temporary hearing difficulties or tinnitus after prolonged headphone use, indicating a significant public health concern.[9]

In Nigeria, the trend is also on the rise, driven by increased access to smartphones and affordable earphone technology. A study conducted reported that over 60% of Nigerian university students use headphones daily, with more than half listening at potentially harmful volume levels.[10] In another study, it was found that only 35% of university students in Southeastern Nigeria were aware of the risks associated with prolonged headphone use,

while a significant proportion (65%) admitted to listening at high volumes for extended periods.[11] The same study highlighted that students often used headphones as a means of concentration while studying, blocking out background noise, or simply as a habit developed over time.

Despite growing evidence of the risks associated with prolonged headphone use, awareness and preventive measures remain low, particularly among university students who are among the most frequent users of these devices. The increasing reliance on earphones for academic, social, and entertainment purposes makes it crucial to assess students' knowledge and attitudes toward the health implications of their usage. Therefore, this study aims to evaluate the awareness of undergraduate students at Abia State University, Uturu, regarding the health consequences of prolonged PLD usage. By identifying knowledge gaps, this study can provide valuable insights to guide health education interventions and policy recommendations to promote safe listening habits among students.

This study is essential because it seeks to assess the level of awareness among undergraduate students of Abia State University, Uturu, regarding the health consequences of prolonged ear and headphone usage. By identifying knowledge gaps and misconceptions, the study will provide valuable insights into the extent to which students understand the risks associated with their listening habits. Furthermore, the findings will serve as a basis for recommending targeted awareness campaigns and interventions to promote safer listening practices. Additionally, the study is justified because it contributes to the growing body of research on auditory health, particularly in the Nigerian context, where such studies are limited. Given the increasing affordability and accessibility of audio devices, the study's findings will be relevant for health professionals, educators, and policymakers in developing strategies to prevent hearing-related issues among young adults. Ultimately, raising awareness about the potential health risks will encourage responsible usage of PLDs, promoting better auditory health and overall well-being among students.

Methods

The study adopted a cross-sectional descriptive design where structured questionnaires were utilised to collect data.

The total population size at the time of the study was known to be 20,684 undergraduate students of Abia State University, Uturu. The sample size that was used for this study was 411 students, determined by Krejcie and Morgan's formula. A stratified random sampling technique was utilised, with strata defined by faculty, department and academic level. The selected faculties include the Faculty of Health Sciences and the Faculty of Humanities; the departments are the Public Health Department and the Department of Mass Communication.

Bourley's Proportional Allocation formula was used to determine the number of students to be sampled in each department and level to ensure proportional representation of departments and levels of study. Data collection was done through a validated, self-administered, and well-structured questionnaire comprising socio-demographic characteristics of participants, usage patterns, awareness, preventive practices, and reported health issues.

Ethical clearance for the study was obtained from the Ethical Clearance office in the Research and Publications department at Abia State University. Informed consent was obtained from all participants prior to data collection, and participation was entirely voluntary. The confidentiality and anonymity of their information was strictly maintained and also communicated to the respondents.

Results

Out of the 411 copies of questionnaire that were administered, 400 (97.3%) were filled and returned. This study assessed the awareness, usage patterns, and health-related effects of prolonged earphone/headphone usage among undergraduate students of Abia State University, Uturu (Table 1). A total of 400 respondents participated, consisting of 165 males (41.3%) and 235 females (58.8%). In terms of age distribution, the majority were within the 21–25-year age group with 200 respondents (50.0%), followed by 134 (33.5%) aged 16–20 years, 55 (13.8%) aged 26–30 years, and 11 (2.8%) above 30 years. Academic level showed that 146 students (36.5%) were in 300 level, 128 (32.0%) in 400 level, and 126 (31.5%) in 200 level.

The most frequently reported health problems (multiple responses allowed) were ear pain (105 respondents, 26.3%), headache (78, 19.5%), sleep disruption (48, 12.0%), ear infection (45, 11.3%), tinnitus (21, 5.3%), earwax blockage and other issues (26 each, 6.5%), noise-induced hearing loss (NIHL) (11, 2.8%), and dizziness (7, 1.8%) (Table 2).

The study also identified statistically significant associations between awareness of health risks from prolonged earphone/headphone usage and several variables (Table 3): age ($\chi^2 = 21.371$, df = 6, $P = 0.002$), gender ($\chi^2 = 6.875$, df = 2, $P = 0.032$), department ($\chi^2 = 53.736$, df = 2, $P = 0.000$), level of study ($\chi^2 = 15.080$, df = 4, $P = 0.005$), regular use of earphones/headphones ($\chi^2 = 386.519$, df = 2, $P = 0.000$), duration of use per day ($\chi^2 = 394.493$, df = 10, $P = 0.000$), and experience of health issues ($\chi^2 = 26.191$, df = 2, $P = 0.000$).

In relation to the experience of health issues due to earphone/headphone use (Table 4), significant associations were found with regular usage ($\chi^2 = 7.303$, df = 1, $P = 0.007$), usage duration per hour ($\chi^2 = 12.700$, df = 5, $P = 0.026$), and awareness of associated health problems ($\chi^2 = 26.191$, df = 2, $P = 0.000$). However, no significant relationships were found between experiencing health issues and socio-

Table 1. Usage Pattern, Purpose/Settings, Awareness, and Preventive Measures of Earphone/Headphone Use Among Undergraduate Students (n = 400).

Variables	Responses	Frequency (n = 400)	Percentage (%)
Use earphones/headphones regularly	Yes	270	67.5
	No	130	32.5
Type of earphones/headphones used (*multiple selection)	Wired earphones	136	26.9
	Wireless Bluetooth earphones	182	36.1
	Over-ear headphones	104	20.6
	On-ear headphones	83	16.4
Use of earphones/headphones while charging phone	Yes	119	29.8
	No	140	35.0
	Sometimes	141	35.2
Purpose of primary use (*multiple selection)	Online classes	136	12.2
	Listening to music	273	24.6
	Watching videos/movies	208	18.7
	Phone calls	208	18.7
	Gaming	116	10.4
	Studying/reading	134	12.1
	Others	36	3.2
Settings used (*multiple selection)	While studying	156	17.2
	During transportation/travel	244	26.9
	While exercising	204	22.5
	While sleeping	84	9.3
	While doing household chores	175	19.3
	Others	44	4.9
Aware that prolonged use of earphones/headphones can cause health problems	Yes	252	63.0
	No	148	37.0
Aware of health risks (*multiple selection)	(n = 252)		
	Hearing loss	152	14.8
	Tinnitus (ringing in the ears)	60	5.8
	Ear infections	119	11.6
	Ear pain	206	20.1
	Headaches	202	19.7
	Dizziness	87	8.5
	Sleep disturbances	99	9.6
	Social isolation	60	5.8
	None of the above	42	4.1
Learnt potential health risks	School/University education	161	19.0
	Health professionals	84	9.9
	Social media	167	19.7
	Friends/family	162	19.1
	News/media	108	12.7
	Personal experience	134	15.8
	Other	32	3.8
Believe volume level when using earphones/headphones can affect hearing	Yes	219	54.8
	No	85	21.3
	Not sure	96	24.0
Aware of the recommended safe volume levels for earphone/headphone use	Yes	228	57.0
	No	172	43.0

Table 1. Continued.

Variables	Responses	Frequency (n = 400)	Percentage (%)
Recommended safe volume level for earphones/headphones use	(n = 228)		
	A. Very low (0%–30%)	50	21.9
	Moderate (31%–60%)	103	45.2
	Loud (61%–85%)	75	32.9
	Very loud (86%–100%)	31	13.6
Precautions taken when using earphones/headphones (*multiple selection)	Limiting usage time	260	65.0
	Keeping volume at moderate levels	319	79.8
	Taking regular breaks	336	84.0
	Cleaning earphones regularly	263	65.8
	Using noise-cancelling headphones	132	33.0
	Not sharing earphones	172	43.0
	None of the above	4	1.0
Frequency of cleaning your earphones/headphones	Daily	103	25.8
	Weekly	122	30.5
	Monthly	62	15.5
	Rarely	84	21.0
	Never	29	7.3
Share your earphones/headphones with others	Yes	128	32.0
	No	155	38.8
	Sometimes	117	29.3

Table 2. Health Issues Experienced due to Prolonged Earphones/Headphones Usage among Undergraduate Students of Abia State University, Uturu

Variables	Responses	Frequency (n = 400)	Percentage (%)
Experienced any health issues that you believe were related to earphone/headphone use	Yes	174	43.5
	No	226	56.5
Sought medical attention	(n = 174)		
	Yes	100	25.0
	No	74	18.5

demographic variables such as age ($\chi^2 = 0.374$, $P = 0.945$), gender ($\chi^2 = 0.957$, $P = 0.328$), department ($\chi^2 = 0.200$, $P = 0.655$), or level of study ($\chi^2 = 0.547$, $P = 0.761$). These results indicate that behavioural and informational factors play a more crucial role than socio-demographic factors in determining both awareness and health outcomes related to earphone/headphone usage.

Discussion

This study provides a comprehensive assessment of the awareness, usage patterns, preventive measures, and health consequences associated with prolonged earphone/headphone use among undergraduate students at Abia State University, Uturu. The findings of the research showed that although most respondents (63.0%) were aware of the possible health concerns connected to continuous use of personal listening devices (PLDs), this knowledge did not always result in preventive behaviour. This indicates a persistent gap between knowledge and practice as commonly reported in auditory health research among young adults.[12 11] The frequency of risky listening practices, including listening loudly and for long periods of time, highlights the discrepancy between risk perception and behaviour change. This gap can be interpreted using the Health Belief Model (HBM), which holds that people undertake preventive behaviours when they believe the advantages of action outweigh any potential drawbacks and regard themselves as vulnerable to negative outcomes.[13] These knowledge deficits are concerning given the high prevalence of regular device use (67.5%), with many students exceeding recommended daily usage durations (>4 hours) and engaging in risky behaviours such as using earphones while charging phones (29.8%) or sharing devices (32.0%). This is consistent with a previous study which also showed that over 50% of the students spent over 3 hours on their devices, which may indicate dependency and the potential for distraction. [15] The study's results showed that higher phone usage may have a correlation with lower GPA among heavy users.

Although students were aware of the possible

Table 3. Factors Associated with Awareness of Prolonged Earphones/Headphones Usage among Undergraduate Students of Abia State University, Uturu

	Awareness of Prolonged Earphones/Headphones Usage				
Variables	**Yes (n=252)**	**No (n=148)**	**Total (n=400)**	**Chi-square**	**Cramer's V**
Age					0.23
16-20 years	79 (19.8)	55 (13.7)	134 (33.5)	*X=21.371*	
21-25 years	135 (33.8)	65 (16.2)	200 (50.0)	*df=6*	
26-30 years	33 (8.3)	22 (5.5)	55 (13.8)	*P=0.002*	
>30 years	5 (1.3)	6 (1.5)	11 (2.8)		0.13
Gender				*X=6.875*	
Male	103 (25.8)	62 (15.5)	165 (41.3)	*df=2*	
Female	149 (37.3)	86 (21.5)	235 (58.8)	*P=0.032*	
Department				*X=53.736*	0.37
Public Health	147 (36.8)	64 (16.0)	211 (52.8)	*df=2*	
Mass Communication	105 (26.3)	84 (21.0)	189 (47.3)	*P=0.000*	
Level					0.19
200 Level	77 (19.3)	49 (12.2)	126 (31.5)	*X=15.080*	
300 Level	90 (22.5)	56 (14.0)	146 (36.5)	*df=4*	
400 Level	85 (21.3)	43 (10.7)	128 (32.0)	*P=0.005*	
Use earphones/ headphones regularly				*X=386.519*	0.69
Yes	187 (46.8)	83 (20.7)	270 (67.5)	*df=2*	
No	64 (16.0)	66 (16.5)	130 (32.5)	*P=0.000*	
Use of earphones/headphones per hour					0.70
Less than 1 hour	56 (14.0)	30 (7.5)	86 (21.5)	*X=394.493*	
1-3 hours	87 (21.8)	42 (10.5)	129 (32.3)	*df=10*	
4-6 hours	54 (13.5)	33 (8.3)	87 (21.8)	*P=0.000*	
7-9 hours	34 (8.5)	27 (6.7)	61 (15.2)		
>9 hours	21 (5.2)	16 (4.0)	37 (9.2)		
Experienced any health issues due to earphone/headphone use				*X=26.191*	0.18
Yes	128 (32.0)	46 (11.5)	174 (43.5)	*df=2*	
No	124 (31.0)	102 (25.5)	226 (56.5)	*P=0.000*	

repercussions, the lack of acute symptoms or apparent harm may have reduced their perceived susceptibility, lowering motivation to practise safe listening behaviours. This behavioural pattern aligns with the optimism bias theory, which suggests that young people tend to underestimate their vulnerability to long-term health consequences, assuming that hearing damage or tinnitus is unlikely to affect them personally. [14 8]

Another significant finding of the study was the higher level of awareness among public health students (52.8%) compared to mass communication students (47.2%). This difference may be attributed to the curriculum's exposure to health-related content. A study has reported similar findings, noting that students who had previously received health literacy training exhibited more cautious listening behaviours and a greater tendency to practise conservative hearing. [2]

The most commonly reported health issues, including ear pain (26.3%), headaches (19.5%), hearing difficulties (36.0%), and tinnitus (5.3%), were strongly associated with modifiable behavioural factors rather than demographic characteristics. This is consistent with the already existing works that reveal the consequences of prolonged PLD use. [1,9] Notably, the study identified a critical paradox: while students who experienced health issues showed higher awareness (73.6%). Academic discipline emerged as a significant predictor of awareness, with public health students (36.8%) outperforming mass communication peers (26.3%). Preventive measures like taking regular listening breaks (84.0%) and keeping noise levels moderate (79.8%) were not consistently followed, despite intermediate levels of awareness. The prevalence of risky behaviours, such as sharing earbuds (32.0%) and using them while charging devices (29.8%), emphasises how peer culture and convenience have a greater impact on health consciousness. However, the study also revealed inconsistent adoption of preventive measures: while 84.0% reported taking breaks and 79.8% moderated volume levels, only 30.5% cleaned devices weekly, and 32.0% shared earphones—practices. Research revealed

Table 4. Factors Associated with Health Issues Experienced due to Prolonged Earphones/Headphones Usage among Undergraduate Students of Abia State University, Uturu

	Experienced any health issues due to earphone/headphone use				
Variables	**Yes (n=174)**	**No (n=226)**	**Total (n=226)**	**Chi-square**	**Cramer's V**
Age					0.03
16-20 years	60 (15.0)	74 (18.5)	134 (33.5)	*X=0.374*	
21-25 years	84 (21.0)	116 (29.0%)	200 (50.0)	*df=3*	
26-30 years	25 (6.3)	30 (7.5)	55 (13.8)	*P=0.945*	
>30 years	5 (1.3)	6 (1.5)	11 (2.8)		
Gender				*X=0.957*	0.05
Male	67 (16.8)	98 (24.5)	165 (41.3)	*df=1*	
Female	107 (26.8)	128 (32.0)	235 (58.8)	*P=0.328*	
Department				*X=0.200*	0.02
Public Health	94 (23.5)	117 (29.3)	211 (52.8)	*df=1*	
Mass Communication	80 (20.0)	109 (27.3)	189 (47.3)	*P=0.655*	
Level					0.04
200 Level	54 (13.5)	72 (18.0)	126 (31.5)	*X=0.547*	
300 Level	61 (15.3)	85 (21.3)	146 (36.5)	*df=2*	
400 Level	59 (14.8)	69 (17.3)	128 (32.0)	*P=0.761*	
Use earphones/ headphones regularly				*X=7.303*	0.14
Yes	130 (32.5)	140 (35.0)	270 (67.5)	*df=1*	
No	44 (11.0)	86 (21.5)	130 (32.5)	*P=0.007*	
Use of earphones/headphones per hour					0.18
Less than 1 hour	37 (21.3)	49 (21.7)	86 (21.5)	*X=12.700*	
1-3 hours	66 (37.9)	63 (27.9)	129 (32.3)	*df=5*	
4-6 hours	31 (17.8)	56 (24.8)	87 (21.8)	*P=0.026*	
7-9 hours	25 (14.4)	36 (15.9)	61 (15.3)		
>9 hours	15 (8.6)	22 (9.7)	37 (9.3)		
Aware prolonged use of earphones/headphones can cause health problems				*X=26.191*	0.23
Yes	128 (73.6)	124 (54.9)	252 (63.0)	*df=2*	
No	46 (26.4)	102 (45.1)	148 (37.0)	*P=0.000*	

that reported hearing deficits among students were mainly due to volume levels rather than frequent use. [16] The knowledge/awareness about hearing loss tends to encourage a positive attitude towards the restriction of PLD use reasonably. Predictions show that an estimated 5-10% of young users of PLDs are at a significant risk of developing hearing loss after 5 or more continuous years of use. [17] [16] Therefore, the results highlight several actionable recommendations:

1. Educational institutions should prioritise institutional health education programmes by integrating mandatory auditory health modules into orientation programmes and general studies curricula.
2. Behavioural interventions should be implemented through interactive workshops demonstrating proper cleaning techniques for different earphone types, safe usage duration through practical scheduling exercises, and alternatives to risky behaviours such as using speaker mode instead of earphones while charging devices.
3. Technological solutions should be explored, including the development or promotion of existing apps that track and limit daily usage time, monitor and regulate volume levels, and provide reminders for taking listening breaks.
4. Policy interventions should be established at institutional levels, including clear university guidelines on maximum recommended daily usage durations, prohibitions on earphone sharing to prevent infections, and safe charging practices for electronic devices.
5. Environmental modifications are equally important, including the creation of designated quiet study zones to reduce noise-induced volume escalation, provision of affordable access to noise-cancelling headphones through university subsidies or manufacturer partnerships, and installation of volume monitoring displays in high-usage areas like libraries and

computer labs.

Conclusion

Ultimately, while earphone/headphone use is deeply embedded in contemporary student life, its associated health risks are preventable through collaborative efforts that bridge awareness with actionable strategies. By integrating education, policy reform, and technological solutions, academic institutions can foster sustainable listening practices that preserve students' auditory health without compromising their academic or social engagement in an increasingly digital world.

Authors' Contribution

Conceptualization: Ezinne Chioma Uka-Kalu, Doris Chinenye Uwazie, Rosemary Ichita Elekeh.
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Competing Interests

The authors declare they have no conflicts of interest.

Ethical Approval

All procedures performed in this study were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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