



KNOWLEDGE OF HEALTH CONSEQUENCES OF EARPHONE USE AMONG UNDERGRADUATE STUDENTS IN THE UNIVERSITY OF NIGERIA, NSUKKA

¹Cylia Nkechi Iweama, ²Olajide Ezekiel Ajani and ^{*1}Eyuche Lauretta Ozoemena

¹Department of Human Kinetics and Health Education, University of Nigeria, Nsukka

²Department of Physical and Health Education, Federal College of Education (Technical) Bichi, Kano State

*Corresponding Author: eyuche.ozoemena@unn.edu.ng; 08063278363

Abstract

This study investigated knowledge of health consequences of earphone use among undergraduate students of the University of Nigeria, Nsukka. Three specific objectives with corresponding research questions guided the study. The study adopted cross-sectional survey research design. The study population comprised of all undergraduate students of the University of Nigeria, Nsukka campus. Multi-stage simple random sampling without replacement procedure was used to select four-hundred (400) consenting undergraduate students of the University of Nigeria, Nsukka for the study. The instrument for data collection consisted of researchers-developed questionnaire titled: Knowledge of Health Consequences of Earphone Use Questionnaire (KHCEU-Q). It was validated by experts and subjected to split-half reliability method that yielded 0.79. Frequency and percentages were used to answer the research questions. The result indicated that sampled undergraduate students have high level of knowledge of health consequences of earphone use; female students have higher level of knowledge of health consequences of earphone use more than male undergraduate students; and students aged 21 to 25 years have highest level of knowledge of health consequences of earphone use than those aged below 20 years and those aged 26 years and above. Key: below 20% = very low knowledge, 20-39% = low knowledge, 40-59% = average/moderate knowledge, 60-80% = high knowledge, 80% and above = very high knowledge. The study recommended among others that government through its health agencies like Nigeria Centre for Disease Control, Federal Ministry of Health, and Health Educators, Nigerian Red Cross Society and others should map out a sensitization and campaign strategy towards creating awareness for the youths on the health consequences of frequent and high decibel earpiece usage.

Keywords: Knowledge, Health Consequences, Earphone Use, Undergraduate Students

Introduction

One of the technologies popular among adolescents is the use of earphones which has increased dramatically in recent years. Research by Cohen revealed that nearly half of teenagers self-reported smartphone addiction, while 59% of adults believed that younger generations were highly attracted to smartphones (Cohen, 2021). World Health Organization (WHO), (2019) has predicted that more than 1 billion adolescents in the world are at the risk of impaired hearing functions because they are accustomed to listening to music for too long at a volume level that is too high. Almost half of all adolescents and young adults (12- 36 years.) are exposed to unsafe levels of sound from the use of personal audio devices. The most common health problems associated with the misuse of earphone are tinnitus, dizziness, difficulty in understanding speech, and decreased ability to hear (WHO, 2019). Earphone use among young adults varies differently worldwide.

Globally, earphone use has become increasingly common in recent years, with people using them for various purposes such as listening to music, watching videos, or making phone calls. While earphones provide a convenient way to enjoy audio content, excessive and improper use can lead to several health consequences. The third National Health and Nutrition Examination Survey in the US found that 2.5 percent of children and adolescents aged (6-19) years old experienced a shift in their hearing threshold in one or both of their ears caused by excessive noise exposure (Niskar et al., 2014). In the 2024 ear survey conducted by Cross Marketing Inc they explored the growing concern about hearing loss among brands in Japan's. The said survey revealed that 61% of Japanese individuals in their 20s used earphones or headphones in the past month, compared to 32% of those in their 70s (Kadence International 2024). Also, Figueiredo et al (2011) stated that 51 percent of students in American high schools have symptoms of hearing loss. An interesting part of the study is that most students prefer high volumes, as adults tend to use more moderate volumes. Research carried out by Byeon (2020) in South Korea,

undergraduates who wore earbuds in loud environments were more likely than non-users to experience subjective hearing issues, poor reading habit and hearing loss. In another study by Alfanoud et al (2023) who investigated how long-term headphones usage affects students' hearing at Qassim University and how headphones use and tinnitus are related. Findings indicated a detrimental effect on hearing health, including a strong correlation with hearing rates and problems hearing friends or family, ringing or whistling noises, trouble hearing whispers, using tinnitus medication on a regular basis, and disclosing hearing loss to a professional.

Africa has witnessed a significant increase in smartphone adoption over the years. As smartphones have become more accessible, the use of earphones and headphones for listening to music, watching videos, and making calls has also increased. A study by Seedat et al (2020) surveyed (269) first year health science students at a University of South Africa. About 90.7 percent of the participants used personal listening devices, with 14.9 percent using them at a high volume and 52.7 percent reporting use of more than two hours a day. Also, in a study conducted by Oghu, et al (2012), which was aimed to determine the prevalence of use of ear phones for entertainment and the prevalence of subjective tinnitus in students in an urban University setting; and the relationship between the two. In conclusion, the prevalence of earphone use among the students and subjective tinnitus was 95.6 percent and 20.6 percent respectively. More than 90 percent of the ear phone users had duration of ear phone use of (3-6) years. Personal music players (PMPs) are widely used among young adults of Nigeria.

In Nigeria, listening to music from earphones, as a leisure activity is on the rise among adolescents and young adults. According to Kathleen (2020), using a survey methodology, used 408 students from five schools in Akinyele Local Government Area as the sample of the study. Based on the report, 61.2% of students preferred reading on smart devices, 91.2% read constantly, and 96.2% of students read for knowledge. While studying, headphones may be a distraction that causes social isolation and a lack of engagement with peer and their book (Chan et al 2022). Based on research, listening to music with lyrics may make it harder to understand and remember what one has learned. Headphones can have a detrimental effect on mental health since they can raise stress and anxiety levels and lower mental health. Furthermore, using headphones inappropriately, as in lectures or collaborative projects, might lower self-awareness, which makes it challenging for pupils to keep track of their comprehension and progress (Gupta et al 2022).

Earphone is a device for converting electric currents into sound waves, held close to or inserted into the ear (Collins English Dictionary, 2023). Earphone is a pair of small or big electro-acoustic transducers which convert an electrical signal to a corresponding sound. Contextually, Headphones let a single user listen to an audio source privately, in contrast to a loud speaker, which emits sounds into the open air for everyone nearby to hear. There are numerous types of earphones available such as; around-ear, over-ear, in-ear, and conductive. Knowledge of the health consequences of earphone use is critical to man's quality of life and everything one does depends on the amount of knowledge one possesses.

Knowledge is the understanding and information a person possesses about various subjects or topics, gained through learning, experience, or study. Knowledge according to Akorede et al. (2022) is a familiarity, awareness, or understanding of someone or something, such as facts, information, descriptions, or skills, that is acquired through experience or education by perceiving, discovering, or learning. Knowledge is the awareness and understanding of information, facts, concepts, and skills acquired through learning, experience, or study. It goes beyond mere data and involves the ability to apply that information effectively in various contexts (Pritchard, 2020). Similar study by Saldanha (2013) has called for serious awareness of the danger of using earphone by young adults. This awareness campaign will no doubt translate to the level of knowledge which they will hold towards it. Thus, it is important to note that if the students who are the dominant users of earphone know it to be very harmful to their health, there are higher chances that they will backtrack and have behavior change towards their use of earphone. Thus, knowledge is a vital factor in this study, as it is guide to the students' use of earphone based on the knowledge of the health consequences. Demographic factors considered in this study include; gender and age.

Gender seems to be influenced by the knowledge of earphone use. Gender refers to the roles, activities, attributes and opportunities that any society considers appropriate for girls and boys, and women and men (WHO, 2020). A study of health education intervention on hearing health risk behaviors in college students by Wang et al (2021) found that in male students, the intervention showed no effectiveness in improving the scores of hearing health

knowledge and health beliefs and was less effective in reducing hearing risk behaviors compared to female students. Age as a factor was examined in this study.

Age refers to the length of time a person or object has existed since its birth, creation, or inception. In the context of humans, it is the number of years that have passed since a person's birth. Several studies have unveiled how age could influence knowledge of earphone use. The influence of age on knowledge of health consequences of earphone use among young adults can vary based on individual factors and exposure to information.

Undergraduate is a student at a college or university who has not received a first and especially a bachelor's degree. An undergraduate degree refers to the first level of higher education, also known as a bachelor's degree. These studies usually take place at a college or university (Pacific College, 2022). These students are mostly found under the age brackets of (16-30) years depending on when they choose to attend the higher institutions for further studies (Ogunniyi, 2015). According to (World Health Organization 2025) over one billion young people worldwide face risk of permanent hearing loss due to prolonged exposure to loud sounds during recreational pastimes such as listening to music and audio gameplay. The World Health Organization advises against using headphones or earbuds for more than an hour per day. Additionally, it said that more than 1.1 billion individuals between the ages of 12 and 25 were at risk of hearing loss (Reddy & Thenmozhi, 2018). The most common health problems associated among undergraduates who misuse earphone are tinnitus, dizziness, difficulty in understanding speech, and decreased ability to hear. Hence this study to investigate knowledge of health consequences of earphone use among undergraduate students in the University of Nigeria, Nsukka.

Statement of the Problem

Listening to music player devices, as a leisure activity is on the raise among adolescents and young adults. With technological advances it is easy to find children, youths, adults especially undergraduates of UNN using electronic devices with earphones; this is due to the convenience of listening to music and news alone anytime and anywhere. Other merits of wearing earphones are: to decrease auditory distraction, increased concentration, learning improvement, decreased distress, increase academic performance, improve result and listen to music independently, among others. One should not use earphones for more than 15 minutes. There is a threat of hearing loss beyond this time. While using earphones, if the sound intensity is more than 85 decibels it can become hearing complications and hearing loss.

Regretfully, the undergraduates seem to expose themselves to loud noise (maximum volume) for music for a long period. This habit when frequent, added to the exposure time, the physical characteristics (such as frequency and intensity), and other non-occupational noise at high sound levels, determine the impact on hearing health. This hearing health could manifest in-terms of distortion, intolerance to loud sounds, dizziness, ear ache, difficulty understanding or hearing words, others include; tinnitus and alterations in auditive thresholds. This problem could also cause extra-auditive damage such as sleep disorders, cardiovascular disorders, stress, fatigue, tension, irritability, inattention, tiredness, nervousness, headache and arterial hypertension. Ear infection may arise especially when individuals share earphones and feel numbness of ears, which is harmful and causes deafness at the long-run.

This situation is worrisome as many undergraduates possess little knowledge on the health consequences of earphone use. However, there seems to be a dearth of research on the socio-demographic variables (gender and age) on the knowledge of health consequences of earphone use among undergraduate students of the University of Nigeria, Nsukka.

Objectives

The main objectives of this study was to investigate the knowledge of health consequences of earphone use among undergraduates of the University of Nigeria, Nsukka. Specifically, the study determined the:

1. Level of knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka.
2. Level of knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka, based on gender
3. Level of knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka, based on age.

Research Questions

The following research questions guided the study:

1. What is the level of knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka?
2. What is the level of knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka, based on gender?
3. What is the level of knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka, based on age?

Methodology

The cross-sectional survey research design was employed for this study. According to Akorede et al (2023), a cross-sectional survey is one that produces a snap shot of a population at a particular point in time. Instead of following a group of subjects over a period of time, cross-section of the subjects of varying ages and other socio-demographic factors are sampled and studied at the same time, and data are obtained at one time from groups or at different stages of development.

University of Nigeria, commonly referred to as UNN, is a federal university located in Nsukka, Enugu State, Nigeria. The University of Nigeria has four campuses; Nsukka, Enugu, and Ituku-Ozalla all located in Enugu State and Aba campus in Abia State. The University of Nigeria was the first full-fledged indigenous and first autonomous university in Nigeria, modelled upon the American educational system. It is the first land-grant university in Africa and one of the five most reputed universities in Nigeria. The University offers (82) undergraduate programmes and (211) postgraduate programmes. The researchers carried out this study in this area because undergraduate students in the university make use of earphones no doubt and is a dominant practice among undergraduates in universities and generally young adults which form the bulk of the university undergraduate population.

The population for this study consisted of all the regular undergraduate students of the University of Nigeria, Nsukka campus. There are ten (10) faculties and seventy-two (72) academic departments in University of Nigeria, Nsukka campus with a total population of twenty- four thousand four hundred and fifty-eight (24,458) students as at 2023/2024 (ICT, University of Nigeria, Nsukka, 2023/2024). Four hundred (400) undergraduate students constituted the sample for this study. This is in line with the guideline of Cohen, et al (2011), that when a population size is 20,000 and above at 95 per cent confidence level (5% interval), the sample size should be 377 and above. A multi-staged sampling procedure was used for the study. In the first stage, balloting without replacement was used to draw out five faculties from the ten faculties on the campus. Stage two involves the use of simple random sampling of ten departments from the five faculties on the campus. Stage three involves the use of simple random sampling of forty students each from the ten departments selected in stage two. This is amounted to a total of 400 undergraduate students who were used to carry out this study.

A self-structured Questionnaire was used to obtain data from the respondents and the instrument was titled: Knowledge of Health Consequences of Earphone Use Questionnaire (KHCEU-Q). The KHCEU-Q was divided into two sections: A and B. Section A contains demographic variables of the respondents while Section B contains ten (10) items on the Knowledge of Health Consequences of Earphone use: Section B was assigned response options of True or False. The face and content validity of the research instrument was established by three (3) experts from the Department of Human Kinetics and Health Education, University of Nigeria, Nsukka. Their constructive criticism, corrections, and suggestions were used to modify and approve the instrument for the data collection. Split-half method was used to establish the reliability of the instrument. Twenty (20) copies of the instrument was administered to undergraduate students of Enugu State University of Science and Technology (ESUT); this is because both universities have the same geographical location and features. Spearman Rank-Order Correlation was used to calculate the reliability of the instrument and a reliability index of 0.79 was obtained.

In order to gain access to the respondents, letters of introduction were obtained from the Head, Department of Human Kinetics and Health Education, University of Nigeria, Nsukka requesting permission and cooperation to conduct the study. Subsequently, the letters were presented to the Heads of the respective departments selected for visitation and data collections. Four hundred (400) copies of the questionnaires was administered to the respondents by the researchers with the assistance of the research assistants who was briefed on the modalities of

the data collection. Every respondent given the questionnaires was encouraged to complete it on the spot of administration and return to the researchers or research assistants to ensure high return rate. The returned copies of the instrument were screened for completion of responses. Information from the instruments was coded into IBM Statistical Package for Social Sciences (SPSS) version 29 and analyzed. The research questions were answered using frequency and percentages, mean and standard deviation. Subsequently, knowledge criteria was: below 20% = very low knowledge, 20-39% = low knowledge, 40-59% = average/moderate knowledge, 60-80% = high knowledge, 80% and above = very high knowledge.

Results

Out of the 400 copies of the questionnaire administered, 12 copies were not duly filled out, thus discarded. Only 388 copies duly filled out were returned and used for analyses which gave a return rate of 97 percent. The findings were presented in tables according to data answering the research questions.

Research Question One: What is the knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka?

Table 1: Knowledge of Health Consequences of Earphone Use Among Undergraduate Students in the University of Nigeria, Nsukka (n = 388)

S/N	Items	Correct f (%)	Incorrect f (%)
1.	Using earphones with noise cancelling properties can reduce the risk of hearing damage	300 (77.3)	88 (22.7)
2.	Sharing earphones with others can increase the risk of ear infections.	335 (86.3)	53 (13.7)
3	Listening to music at high volumes through earphones can lead to hearing loss.	358 (92.3)	30 (7.7)
4.	Taking breaks while using earphones is necessary for maintaining ear health.	341 (87.9)	47 (12.1)
5.	Lowering the volume while using earphones can help prevent potential hearing issue.	351 (90.5)	37 (9.5)
6.	Going for medical check-up can help in early detection of ear and hearing problems	355 (91.5)	33 (8.5)
7.	Ringing in the ears (tinnitus) is not associated with prolonged exposure to loud music through earphones.	218 (56.2)	170 (43.8)
8.	There is no specific recommended maximum duration for using earphones per day.	172 (44.3)	216 (55.7)
9.	Earphone use has no impact on balance or dizziness.	212 (54.6)	17 (45.4)
10.	Earphone can lead to earwax buildup or blockage.	274 (70.6)	114 (29.4)
	Cluster (%)	90.5	9.5

Key: below 20% = very low knowledge, 20-39% = low knowledge, 40-59% = average/moderate knowledge, 60-80% = high knowledge, 80% and above = very high knowledge.

Results in Table 1 showed that, undergraduate students in the university of Nigeria, Nsukka have high level of knowledge of health consequences of earphone use (75.2%)

Research Question Two: What is the knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka based on gender?

Table 2: Knowledge of Health Consequences of Earphone Use Among Undergraduate Students in the University of Nigeria, Nsukka based on gender (n=388)

S/N	Items	Male (n=186) Correct f(%)	Female (n=202) Correct f(%)
1	Using earphones with noise cancelling properties can reduce the risk of hearing damage	150(80.6)	150(74.3)
2	Sharing earphones with others can increase the risk of ear infections.	152(81.7)	183(90.6)
3	Listening to music at high volumes through earphones can lead to hearing loss.	160(86.0)	198(98.0)
4	Taking breaks while using earphones is necessary for maintaining ear health.	156(83.9)	185(91.6)
5	Lowering the volume while using earphones can help prevent potential hearing issue.	167(89.8)	184(91.1)
6	Going for medical check-up can help in early detection of ear and hearing problems	172(92.5)	183(90.6)
7	Ringing in the ears (tinnitus) is not associated with prolonged exposure to loud music through earphones.	96(51.6)	122(60.4)
8	There is no specific recommended maximum duration for using earphones per day.	68(36.6)	104(51.5)
9	Earphone use has no impact on balance or dizziness.	93(50.0)	119(58.9)
10.	Earphone can lead to earwax buildup or blockage.	125(67.2)	149(73.8)
	Cluster (%)	86.0	94.6

Key: below 20% = very low knowledge, 20-39% = low knowledge, 40-59% = average/moderate knowledge, 60-80% = high knowledge, 80% and above = very high knowledge.

Results in Table 2 showed that, female undergraduate students (78.1%) in the university of Nigeria, Nsukka have higher level of knowledge of health consequences of earphone use more than male undergraduate students (72.0%).

Research Question Three: What is the knowledge of health consequences of earphone use among undergraduates of University of Nigeria, Nsukka based on age?

Table 3: Knowledge of Health Consequences of Earphone Use Among Undergraduate Students in the University of Nigeria, Nsukka based on age (n=388)

S/N	Items	Below 20 years (n=103) Correct f (%)	21-25 years (n= 225) Correct f (%)	26 years and above (n= 60) Correct f (%)
1.	Using earphones with noise cancelling properties can reduce the risk of hearing damage	75(72.8)	178(79.1)	47(78.3)
2.	Sharing earphones with others can increase the risk of ear infections.	89(86.4)	198(88.0)	48(80.0)
3.	Listening to music at high volumes through earphones can lead to hearing loss.	96(93.2)	210(93.3)	52(86.7)
4.	Taking breaks while using earphones is necessary for maintaining ear health.	85(82.5)	202(89.8)	54(90.0)
5.	Lowering the volume while using earphones can help prevent potential hearing issue.	86(83.5)	211(93.8)	54(90.0)
6.	Going for medical check-up can help in early detection of ear and hearing problems	93(90.3)	210(93.3)	52(86.7)
7.	Ring in the ears (tinnitus) is not associated with prolonged exposure to loud music through earphones.	53(51.5)	137(60.9)	28(46.7)
8.	There is no specific recommended maximum duration for using earphones per day.	41(39.8)	103(45.8)	28(46.7)
9.	Earphone use has no impact on balance or dizziness.	46(44.7)	126(56.0)	40(66.7)
10.	Earphone can lead to earwax buildup or blockage.	78(75.7)	149(66.2)	47(78.3)
	Cluster (%)	87.4	92.9	86.7

Key: below 20% = very low knowledge, 20-39% = low knowledge, 40-59% = average/moderate knowledge, 60-80% = high knowledge, 80% and above = very high knowledge.

Results in Table 3 showed that, undergraduate students in the university of Nigeria, Nsukka aged 21 to 25 years (76.6%) have the highest level of knowledge of health consequences of earphone use than those aged below 20 years (72.0%) and those aged 26 years and above (75.0%).

Discussion of Findings

Findings of research question one in Table 1 showed that, undergraduate students in the University of Nigeria, Nsukka have high level of knowledge on health consequences of earphone use. This finding was expected and not surprising. This is because most undergraduates make use of earphone as it is a modern technology and this earphone come with clear warnings on how they should be used. This finding agrees with the finding of Abeer, et al (2019) on the knowledge, perception and practices of students in Zagazig University that approximately less than two thirds (64%) of studied students used earphones, and there was a marked improvement in participant's knowledge, perception and practices regarding earphones hazards and healthy hearing post implementation of educational program.

Besides, findings of research question two in Table 2 showed that female undergraduate students in the University of Nigeria, Nsukka have higher level of knowledge more than male undergraduate students. This is expected and not surprising as women tend to be more responsible with regards to the usage of earphones or anything health related. This is in agreement with Abdullah, et al (2021) who conducted a study among the teenager and adult population of Eastern Province, Saudi Arabia. The study reviewed that there was an adequate awareness toward the side effects of excessive usage of earbuds among teenagers and young adults. Females showed better awareness compared to males and short-term usage of earbuds was a significant predictor of good awareness. This finding is in contrast with Kavya and Rajitha (2023) who revealed that majority 81.2% of the girls and 82.5 % of the boys had average knowledge on hazards of ear phone usage. The mean knowledge score of girls was found to be 12.7 with standard deviation 3.12 and mean knowledge of boys were found to be 11.7 with standard deviation 3.18.

Again, research question three findings in Table 3 showed that, undergraduate students in the University of Nigeria, Nsukka aged 21 to 25 years have high level of knowledge of health consequences of earphone use than those aged below 20 years and those aged 26 years and above. This finding is surprising and not expected. This is because it is expected that those aged 26 years and above should have high level of knowledge than any other age group, reason being that they are mature and should be more knowledgeable about earphone use and implications of misuse. This finding disagrees with the finding of Seitz et al (2019) on the awareness of the risks of listening to music with earphones among young adults. The study aimed to assess the awareness and knowledge of young adults regarding the potential risks of listening to music with earphones. The findings indicated that younger participants (aged 18-25) displayed lower levels of awareness and knowledge about the health consequences compared to older participants (aged 26-40). The study highlighted the need for targeted educational campaigns to raise awareness among young adults.

Conclusions

Based on the findings of the study it was concluded that the undergraduate students in the University of Nigeria, Nsukka:

1. Have high level of knowledge of health consequences of earphone use.
2. Female have high level of knowledge of health consequences of earphone use more than male undergraduate students.
3. Aged 21 to 25 years have high level of knowledge of health consequences of earphone use than those aged below 20 years and those aged 26 years and above.

Recommendations

Based on the findings and conclusions of the study, the following recommendations were suggested that:

1. Government through its health agencies should map out a serious sensitization and campaign strategy towards creating awareness for the youths on the health implications of frequent and high decibel earpiece practice and usage.
2. The youths themselves should develop behavior change and compliance towards their usage of earpiece from the little campaigns available in order to protect themselves from harmful health consequences of earpiece usage.
3. Getting various gratifications from the use of earpiece by undergraduate students should be discouraged by the campaigns to be rolled out by health agencies. Most young adults should be made to understand that following certain trends as regards to earpiece usage could be detrimental to their health.

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