KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARD THE USE OF PERSONAL AUDIO DEVICES AMONG HIGH EDUCATION STUDENTS

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ABSTRACT: The widespread use of personal audio devices (PADs) such as smartphones, MP3 players, and tablets among higher education students has raised significant concerns regarding hearing health. This study aims to explore the knowledge, attitudes, and practices (KAP) of higher education students towards the use of PADs. A total of 127 high education students participated in the occupational health and safety short course at Selandar Community College. Participated in a survey that assessed their usage patterns, awareness of risks, and adherence to safe listening practices. Survey questionnaires are used to identify knowledge, attitude, and practice toward the use of personal audio devices. This study uses a questionnaire adapted from Alanazi et al. (2021). The findings reveal that 95% of respondents regularly use PADs, with 63% preferring earphones. A significant proportion of students (59.05%) use PADs daily, and 27.55% listen for more than two hours continuously. While 62.20% of students use PADs at medium volume levels, 31.49% listen at high volumes, posing a risk of noise-induced hearing loss (NIHL). Notably, 56.69% of respondents increase the volume in noisy environments, further exacerbating potential hearing damage. The study highlights a notable gap in knowledge, with many students unaware of safe listening practices and the long-term consequences of high-volume exposure. Attitudes towards PAD use are generally casual, with a tendency to prioritize immediate auditory satisfaction over hearing health. The data underscores the need for targeted educational interventions to raise awareness and promote safer listening habits. In conclusion, while PADs offer significant benefits for education and entertainment, their misuse poses serious risks to hearing health. Comprehensive educational campaigns, protective measures, and behavioral interventions are recommended to foster a culture of safe PAD use among higher education students. Continuous research and monitoring are essential to adapt strategies and ensure their effectiveness in mitigating the risks associated with PAD usage.

KEYWORDS: *PADs, hearing, High Education Students.*

1.0 INTRODUCTION

The proliferation of personal audio devices, such as smartphones, MP3 players, and tablets, has revolutionized the way individuals access and consume audio content. These devices offer convenience, portability, and a wide array of entertainment and educational options, making them ubiquitous in modern society. However, their widespread use also raises concerns about potential negative impacts on hearing health, social interactions, and overall well-being. Understanding the knowledge, attitudes, and practices (KAP) toward the use of personal audio devices is crucial for developing strategies to promote safe listening habits and mitigate potential risks.

Knowledge encompasses the awareness and understanding of the benefits and risks associated with personal audio device use. This includes knowledge about the potential for noise-induced hearing loss (NIHL), the importance of volume control, the duration of listening, and the use of protective measures such as noise-canceling headphones or earbuds.

Awareness of manufacturer guidelines and public health recommendations regarding safe listening levels and durations is also part of this domain. Attitude refers to the perceptions, beliefs, and feelings individuals have about using personal audio devices. This includes the perceived importance of hearing health, the value placed on listening to music or other audio content at high volumes, and the willingness to adopt safe listening practices.

Attitudes can be influenced by a variety of factors, including peer pressure, cultural norms, and personal experiences. Practice involves the actual behaviors and habits related to personal audio device use. This includes the frequency and duration of listening, the typical volume levels at which individuals listen, and the use of protective measures. Practices can be influenced by both knowledge and attitudes, as well as by external factors such as social settings, availability of devices, and the presence of health warnings or educational campaigns.

The knowledge, attitude, and practice toward the use of personal audio devices among higher education students have been studied extensively. According to LIU Yuanyuan. et al (2023) high school students in Beijing have been found to have high usage rates of personal audio equipment, which can lead to hearing impairment and related symptoms. A study among medical students found that most students (95.9%) used mobile phones for personal audio device (PAD) usage, with 52.8% preferring over-the-ear headphones and 34% using earbuds, (Basu et al., 2019). A study in the UAE found that only 50.5% of participants had a good level of knowledge about the safe use of audio devices and their impact on ear health but they use audio devices at high volumes, with 41.8% of students in the UAE preferring to use their devices at deafening volumes, and the majority of students (72%) in the UAE use audio devices in a continuous pattern, which can increase the risk of hearing impairment (Prajakta I. Dongritot1, Afrah Mazumder1, Arwa A. Mohammed1, Fariha N. Khazi1, 2023). According to You et al. (2020) many college students do not recognize the importance of preventing hearing loss while using personal listening devices, even in noisy environments. Impact on ear health, high usage rates of personal audio equipment can lead to hearing impairment and related symptoms among high school students. Besides the unsafe practice of using audio devices has been linked to ear health issues, such as insomnia and numbness of the ear and there is a need for greater awareness and education among college students about the importance of hearing conservation while using personal listening devices.

The KAP framework highlights the complexity of personal audio device use and the multifaceted approach needed to address it. Challenges include the need for targeted education to increase awareness of safe listening practices, the development of user-friendly technology that promotes safe listening, and the creation of policies that protect hearing health without unduly restricting personal freedom.

Moreover, the KAP toward personal audio devices is not static; it evolves with technological advancements, changes in social norms, and shifts in individual preferences. Continuous research and monitoring are essential to adapt interventions and maintain their relevance.
Understanding the knowledge, attitudes, and practices toward the use of personal audio devices is critical for promoting safe listening habits and preventing hearing loss. By addressing the gaps in knowledge, influencing attitudes positively, and encouraging healthier practices, stakeholders can work together to mitigate the risks associated with these devices while preserving their benefits.

2.0 PROBLEM STATEMENT

The use of personal audio devices (PADs), such as smartphones, MP3 players, and tablets, has become a prevalent feature in the daily lives of higher education students. These devices offer a convenient way to access educational materials, entertainment, and communication platforms. However, the widespread and often prolonged use of PADs, particularly with

earphones or headphones, raises concerns about potential negative impacts on hearing health, academic performance, and social interactions.

Despite the benefits of PADs, there is a concerning lack of awareness among higher education students regarding the safe use of these devices. This lack of knowledge may lead to risky listening practices, such as listening to audio at high volumes for extended periods, which can result in noise-induced hearing loss (NIHL). Additionally, the attitudes toward safe listening practices are often casual or dismissive, with many students underestimating the potential long-term consequences of their habits. Furthermore, the practice of using PADs is often not aligned with recommended safety guidelines, as students may prioritize immediate gratification over long-term health implications.

Several studies highlight the issues related to the use of personal audio devices (PADs) among students, including, high school students in Beijing who have high usage rates of personal audio equipment, which can lead to hearing impairment and related symptoms. According to 5 Reasons Audio Devices Are Essential for Learning - AVID Products, Inc. (2022). The use of audio devices can promote digital equity by providing equal access to learning resources. However, only 30% of schools have purchased audio-enhancing technologies, leaving a significant number of students without accessibility. Another study found that many college students habitually use personal listening devices at high levels in noisy environments, which can contribute to hearing loss. The study also noted that students do not recognize how to prevent hearing loss. A study found that 38% of participants preferred listening to music at volumes above 85 dB(A), which is considered a high risk for hearing loss, Basu et al. (n.d.). According to Toolkit for Safe Listening Devices and Systems (n.d.) observed that 50.3% of students used audio devices in an unsafe manner, which can contribute to hearing loss. The study also noted that students do not recognize how to prevent hearing loss. The World Health Organization (WHO) and the International Telecommunications Union (ITU) emphasize that hearing loss due to loud sounds is a significant health challenge. They recommend implementing the Global Standard for Safe Listening Devices (ITU-T H.870) to regulate user exposure to sound and prevent hearing loss.

Research indicates that most users of personal music players choose sound volume settings that are unlikely to cause hearing loss. However, some people set the volume control very high or listen to music for many hours per day. Volume settings chosen by users generally range from 80 to 115 dB(A) and mean weekly exposure time can range from less than an hour to 14 hours, Personal Music Players and Hearing: 8. How Are Personal Music Players Typically Used? (n.d.)

These studies collectively indicate that there is a significant problem with the knowledge, attitude, and practice toward the use of personal audio devices among higher education students. It is essential to address these issues through education and awareness campaigns to promote safe and responsible use of audio devices. Addressing the problem of unsafe PAD use among higher education students is crucial for preventing NIHL and promoting healthy audio consumption habits. By fostering a culture of awareness and responsible use, educational institutions can play a pivotal role in safeguarding the hearing health and overall well-being of their students.

3.0 LITERATURE REVIEW

The integration of personal audio devices (PADs) into the daily lives of higher education students has been a subject of increasing interest in the field of health and education research. PADs, including smartphones, MP3 players, and tablets, offer a range of benefits such as access to educational resources, entertainment, and communication tools. However, their use also poses potential risks, particularly to hearing health. This literature review

examines the current knowledge, attitudes, and practices (KAP) of higher education students regarding the use of PADs and explores the implications for their health and academic performance.

Personal audio devices (PADs) have become an integral part of modern life, particularly among high education students. However, excessive use of these devices can lead to noise-induced hearing loss (NIHL) and other hearing-related problems. This literature review aims to summarize the current knowledge, attitudes, and practices regarding the use of PADs among higher education students.

A literature review on the knowledge, attitude, and practice (KAP) toward the use of personal audio devices among higher educational students would involve an examination of existing research and studies that explore how students in higher education settings engage with personal audio devices, such as headphones, earbuds, and portable music players. This review would aim to synthesize the findings on students' awareness of potential risks, their attitudes towards device usage, and the actual practices surrounding the use of these devices.

Over 1 billion young people globally are at risk of hearing loss due to unsafe listening practices while using personal audio devices. According to The World Health Organization (WHO) estimates that more than 1.5 billion people worldwide are at risk of some form of hearing loss due to unsafe listening practices. Another study by Nicola Divian et al. (2017) noted that even people who are open to trying hearing protective interventions are uncertain about their effectiveness. This indicates a knowledge gap regarding the efficacy of protective measures. The same study found that respondents preferred educational messages that encourage either limiting listening time or turning down the volume, rather than using protective devices. This suggests that students may be more receptive to simple volume and time management strategies compared to using specialized equipment. However, the same study also reported that many respondents would not act on warnings from others to turn down the volume. This suggests that simply providing knowledge may not always translate to changes in behavior. According to Peng et al. (2007), long-term use of personal audio devices can impair hearing function.

The literature review will conclude by summarizing the key findings on students' KAP regarding personal audio device use. It would highlight areas where knowledge is lacking, attitudes are problematic, and practices are potentially harmful. The review could also identify gaps in the current research and suggest areas for future study, such as the development of targeted educational interventions to improve knowledge and promote safer listening practices among highly educated students.

4.0 RESEARCH OBJECTIVE

The research objective of studying knowledge, attitudes, and practices (KAP) toward the use of personal audio devices among higher education students is multifaceted and aims to gain a comprehensive understanding of how these devices are integrated into the daily lives of students. This research can provide valuable insights into the potential benefits and risks associated with the use of personal audio devices, as well as inform strategies for promoting healthy listening habits.

5.0 RESEARCH METHODOLOGY

A total of 130 questionnaires were distributed with a target total of 97 respondents from various demographic backgrounds. A total of 127 respondents have participated in this study, and this shows that this study meets a sufficient sampling size based on the total population of 130 (based on the total number of) as suggested by Krejcie, R. V., & Morgan, D. W. (1970).

Respondents of this study are high-education students who participate in the PSH course at Selandar Community College. Survey questionnaires are used to identify knowledge, attitudes, and practices (KAP) toward the use of personal audio devices among higher education students

6.0 ANALYSIS AND RESULTS

130 questionnaires were distributed to all participants of the Occupational Health and Safety Basic Course under the Lifelong Learning program. At the end of the collection period, approximately 130 questionnaires were received and only 127 completed questionnaires were used for further analysis. The remaining 3 questionnaires were rejected due to incomplete answers by the respondent. Based on the primary data obtained from 127 questionnaires, most of the respondents were male which is 59.05% or 75 respondents and the remaining 40.94% or 52 were females. Aged between 19 to 20 years, involving 52.75% of respondents. While 43.30% of respondents are aged between 20 to 21 and the rest of them around 3.93% are in the age group 23 to 24 years. All the respondents who were studied had a high school education level.

Table 1: Demographic distribution among the study sample.

		Frequency	Percent
Gender	Male	75	59.05
	Female	52	40.94
Age	19-20	67	52.75
	21-22	55	43.30
	23-24	5	3.93
Level of education	High school	127	100

In Table 2, the data shows the usage of PADs by gender. 95% of the surveyed individuals owned and used PADs. Among the PAD users, 63% preferred using earphones, 24% used both earphones and headphones, and 13% used headphones.

Table 2. Use of PADs by gender in the study sample.

Gender	Variable		N	Percent
	Male	Yes	71	55.9
		No	4	3.14
	Female	Yes	50	39.37
		No	2	1.57

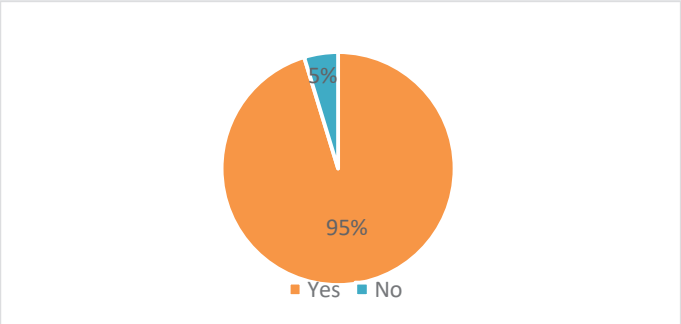

Figure 1: Use of PADs among the sample

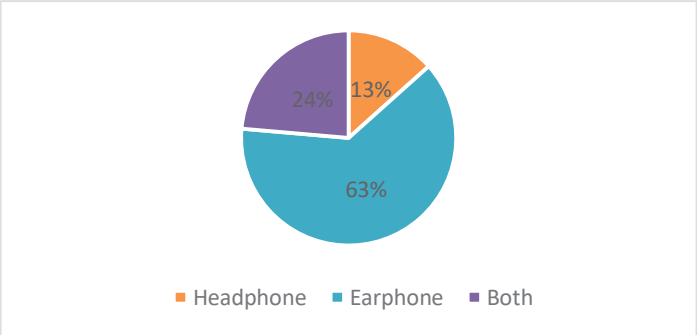

Figure 2. Type of PADs used by the sample

Table 3. Habits of the use of PADs in the study sample.

Variables		%	N
Days used a week	1-2 days	17.32	22
	3-5 days	23.62	30
	6-7 days	59.05	75
Hours used continuously	30 minutes or less	18.89	24
	40 minutes to 1 hour	32.28	41
	90 minutes to 2 hours	21.25	27
	More than 2 hours	27.55	35
PADs volume levels	Low volume	6.29	8
	Medium volume	62.20	79
	High volume	31.49	40
Taking breaks during the use of PADs	Yes	32.28	41
	No	14.17	18
	Sometimes	53.54	68
Increase headphone volume levels when in a noisy background	Yes	56.69	73
	No	14.17	18
	Sometimes	22.83	29
	Don't know	5.51	7

Table 3 details the habits of Personal Audio Device usage within a study sample. Outlines the frequency of use, duration of continuous use, volume levels, the practice of taking breaks and adjusting headphone volume in noisy backgrounds.

Regarding the frequency of use, the majority of the sample use PADs for 6-7 days a week (59.05%, n=75), followed by 3-5 days (23.62%, n=30) and 1-2 days (17.32%, n=22). The duration of continuous use varies, with the highest percentage using PADs for more than 2 hours (27.55%, n=35), followed by 90 minutes to 2 hours (21.25%, n=27), 40 minutes to 1 hour (32.28%, n=41), and 30 minutes or less (18.89%, n=24).

The volume levels during PADs use are predominantly medium (62.2%, n=79), with a significant portion using high volume (31.49%, n=40), and a minority using low volume

(6.29%, n=8). The practice of taking breaks while using PADs is inconsistent, with the largest group responding "sometimes" (53.54%, n=68), followed by "yes" (32.28%, n=41) and "no" (14.17%, n=18).

In noisy backgrounds, there is a tendency to increase headphone volume, with 56.69% (n=73) reporting doing so, while 14.17% (n=18) do not, 22.83% (n=29) do so sometimes, and 5.51% (n=7) are unsure.
In summary, the study sample exhibits a high frequency and duration of PADs use, favoring medium to high volume levels, and has varying practices regarding taking breaks and adjusting volume in noisy environments.

Table 4. The pattern of the use of PADs in the study sample.

Variables	N	%
Studying	23	18.11
Playing (Video games)	77	60.62
Walking	95	74.80
In car	60	47.24
Working	38	29.92
Housekeeping	67	52.75
Watching movies	86	67.71

Students could choose more than one activity.

Specifically, Table 4, outlines the pattern of Personal Activity Devices (PADs) usage within a study sample. The table presents the frequency and percentage of PAD usage across various activities. The highest percentage of PAD usage is observed during walking, with 74.80% of the sample using PADs for this activity. Watching movies is the second most popular activity with PAD usage at 67.61%, followed by playing (Video games) at 60.62%. A significant portion of the sample also uses PADs for housekeeping (52.75%) and in the car (47.24%). Studying and working have lower percentages of PAD usage at 18.11% and 29.92%, respectively. This data suggests that PADs are predominantly used during leisure and transportation activities, with less integration into work and study routines within the study sample.

Table 5. Signs and symptoms reported by the study sample.

Presence of symptoms		N	%
	Ask people to repeat themselves	91	71.65
	Difficulty sleeping or concentrating	40	31.49
	Pain\Pus	19	14.96
	Ringing	9	7.08

Table 5 outlines the prevalence of various signs and symptoms reported by participants in a study. The findings indicate that the most commonly reported symptom is the need to ask people to repeat thmselves, which was experienced by 91 participants, representing 71.65% of the sample. The second most prevalent symptom is difficulty sleeping or concentrating, reported by 40 individuals, accounting for 31.49% of the sample. Less common symptoms include the presence of pain or pus, experienced by 19 participants (14.96%), and ringing, which was reported by 9 individuals (7.08%).

Table 6. Level of knowledge about the harmful effects of PADs in the study sample.

Variables		N	%
The use of a PAD in some situations may be dangerous	Strongly agree	39	30.70
	Agree	47	37.00
	Neutral	24	18.89
	Disagree	13	10.23
	Strongly disagree	4	3.14
Using a PAD at loud listening levels may damage hearing.	Strongly agree	41	32.28
	Agree	47	37.00
	Neutral	30	23.62
	Disagree	6	4.72
	Strongly disagree	3	2.36
It is not important to obey manufacturers' warnings regarding the safe use of PAD.	Strongly agree	1	0.78
	Agree	3	2.36
	Neutral	10	7.87
	Disagree	43	33.85
	Strongly disagree	70	55.11
Scientific proof that using PAD at high volume levels can cause hearing loss would not lead me to change my use	Strongly agree	22	17.32
	Agree	33	25.98
	Neutral	31	24.40
	Disagree	18	14.17
	Strongly disagree	23	18.11
Using PADs for long periods can lead to Tinnitus	Strongly agree	56	44.09
	Agree	23	18.11
	Neutral	11	8.66
	Disagree	25	19.68
	Strongly disagree	12	9.44
Using PADs for long periods can lead to Headache	Strongly agree	43	33.85
	Agree	37	29.13
	Neutral	17	13.38
	Disagree	19	14.96
	Strongly disagree	11	8.66
Using PADs for long periods can lead to hearing loss	Strongly agree	39	30.70
	Agree	33	25.98
	Neutral	14	11.02
	Disagree	25	19.68
	Strongly disagree	16	12.59

The document presents a survey on the level of knowledge about the potentially harmful effects of Personal Audio Devices (PADs) among a study sample. It includes participants' responses to various statements related to the dangers of PAD use, specifically concerning situations where their use may be dangerous, the risk of hearing damage at loud volumes, the importance of adhering to manufacturers' safety warnings, and the likelihood of changing usage habits if presented with scientific evidence of hearing loss.

A significant portion of the sample acknowledges the potential danger of using PADs in certain situations, with 67.7% either agreeing or strongly agreeing with this statement. Similarly, a majority recognize the risk of hearing damage from loud listening levels, with 69.28%

expressing agreement or strong agreement. There is a strong consensus that manufacturers' warnings should be heeded, as 88.96% either disagree or strongly disagree with the statement that it is not important to obey these warnings.

Despite this awareness, a considerable number of respondents indicated they might not alter their PAD usage even if scientific proof of hearing loss was provided. Only 35.43% strongly or somewhat disagree with the statement that such evidence would not change their use.

Extended use of PADs is also associated with risks such as Tinnitus and headaches, with 62.2% and 62.98% of the sample, respectively, agreeing or strongly agreeing that long periods of use can lead to these conditions. Hearing loss from prolonged PAD use is also a concern, with 56.68% agreeing or strongly agreeing that it can result in hearing loss.

In summary, the study sample demonstrates a moderate to high level of awareness regarding the potential dangers of PAD use, particularly hearing damage and the importance of safety warnings. However, there is a concerning degree of resistance to the idea of changing usage habits in response to scientific evidence of harm.

7.0 DISCUSSION

The study highlights several critical findings regarding the knowledge, attitudes, and practices (KAP) of higher education students towards the use of personal audio devices (PADs). The data indicates that a significant proportion of students regularly use PADs, with a substantial number engaging in practices that pose risks to their hearing health. The study reveals a knowledge gap among students regarding the safe use of PADs and the potential risks associated with their use. Despite the awareness of the benefits and risks, many students continue to engage in unsafe listening practices, such as listening at high volumes for extended periods. This knowledge gap is a significant concern as it indicates that awareness alone does not necessarily lead to safer practices. Students' attitudes towards the use of PADs are generally casual, with many underestimating the potential long-term consequences of their listening habits. The preference for high volume levels, particularly in noisy environments, underscores a disregard for the potential impact on hearing health. This casual attitude is further reflected in the resistance to adopting protective measures such as volume control or taking breaks during listening sessions. The study's findings on the actual practices of students reveal several risky behaviors. A majority of students use PADs almost daily, with a significant number listening for more than two hours continuously at medium to high volume levels. Additionally, over half of the respondents reported increasing the volume in noisy backgrounds, further exacerbating the risk of noise-induced hearing loss (NIHL).

8.0 CONCLUSION

The study underscores the urgent need for targeted educational interventions to address the gaps in knowledge and to promote healthier attitudes and practices among students regarding PAD use. Key recommendations include educational campaigns to implement comprehensive awareness programs that focus on the long-term risks of unsafe PAD use and the importance of hearing health. Protective Measures, encouraging the use of protective measures such as noise-canceling headphones, volume limiters, and promoting regular breaks during listening sessions. Behavioral Interventions to develop strategies for changing attitudes towards safe listening practices, including peer-led initiatives and incorporating safe listening guidelines into educational curriculums. By addressing these areas, stakeholders can work towards mitigating the risks associated with PAD use while preserving the benefits these devices offer in educational and entertainment contexts. Continuous monitoring and research are essential to adapt and refine these interventions, ensuring their effectiveness and relevance in promoting safe listening habits among higher education students.

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