Nursing Frontiers Research and Practice
2026.Vol.1, No.2, (26-32)
https://doi.org/10.35730/ptajz618

Knowledge of The Health Risks of Mobile Phone Radiation Among Abdurrab University Student, Pekanbaru

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Type of article: Original Article

ARTICLE INFORMATION

Received: July 21st 2026
Revised: August 10th 2026
Accepted: September 25th 2026
Available online: September 30th 2026

KEYWORDS

Health knowledge, Mobile phone radiation, Students, University students

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ABSTRACT

Background: Mobile phones are deeply integrated into university students' learning, communication, and everyday activities. This makes students' understanding of potential health issues related to mobile-phone use relevant to health promotion. Aim and Scope: This study aimed to describe the level of knowledge regarding potential health risks associated with mobile phone radiation among students at Universitas Abdurrab, Pekanbaru, in 2026. Methods: A quantitative descriptive cross-sectional study was conducted among approximately 3,035 students. A total of 354 respondents were selected using simple random sampling. Data were collected online on 11 February 2026 using a 20-item true/false questionnaire. Correct responses were scored 1 and incorrect responses 0. Knowledge was classified as good (≥76%), moderate (56–75%), or poor (<56%). Data were summarized using frequencies and percentages. Results: Among 354 respondents, 95 (26.84%) had good knowledge, 157 (44.35%) had moderate knowledge, and 102 (28.81%) had poor knowledge. Most respondents were 21 years old (196; 55.36%), female (272; 76.83%), and enrolled in the Bachelor of Pharmacy program (112; 31.64%). Conclusion: Moderate knowledge was the most common category, while nearly three in ten respondents had poor knowledge. The findings provide a local baseline for campus health promotion and indicate the need for accessible, evidence-informed education that distinguishes established information from areas of scientific uncertainty regarding mobile-phone radiation and health.

INTRODUCTION

University students are one of the groups that use mobile phones frequently. Mobile phones are used for learning, communication, finding information, entertainment, and social interaction. The use of mobile phones has become an important part of students' daily activities. However, excessive use may be related to several health problems, such as sleep disturbance, headache, eye discomfort, and musculoskeletal complaints. These problems may also be related to long screen time, posture, and other patterns of smartphone use.

Mobile phones produce radiofrequency electromagnetic fields (RF-EMF), which are classified as non-ionizing radiation. The possible health effects of exposure to RF-EMF have been studied by many researchers, but the findings are still varied. Several studies have discussed the possible relationship between mobile phone use and health problems, while other studies have not found clear evidence of

harmful effects at normal exposure levels. Therefore, information about mobile phone radiation needs to be delivered carefully and based on scientific evidence.

Several studies have discussed possible effects related to mobile phone use, including headache, sleep problems, reproductive outcomes, neurological symptoms, and visual discomfort. Other studies have also reported problems related to prolonged smartphone use, such as digital eye strain and musculoskeletal pain. These findings show that students need adequate knowledge about the use of mobile phones and the possible health effects associated with their use.

Knowledge is an important part of health behavior. Students who have adequate information can make better decisions about the use of technology. Health education can provide information about appropriate mobile phone use, screen time, sleep, eye health, body position, and the use of reliable health information. Therefore, knowledge about the health risks of mobile phone radiation is important for students.

A preliminary interview was conducted with eight students at Universitas Abdurrab Pekanbaru. The interview showed that only two students knew about the possible health risks of mobile phone radiation, while six students did not know about them. This condition encouraged the researcher to conduct a study to describe students' knowledge about the health risks of mobile phone radiation.

The questionnaire used in this study measured knowledge about mobile phone radiation and health. The questions covered the definition and health relevance of mobile phone radiation, screen time, possible effects, possible health problems, and ways to reduce exposure. The study focused on describing students' knowledge and did not measure actual radiation exposure or clinical health conditions.

From a nursing and health perspective, information about students' knowledge can be used as a basis for providing health education. The results can also be used as additional information for students and as a reference for further research related to mobile phone use and health. The aim of this study was to determine the level of knowledge about the health risks of mobile phone radiation among students at Universitas Abdurrab Pekanbaru in 2026.

METHOD

This study used a quantitative method with a descriptive design. The descriptive design was used to describe the level of knowledge about the health risks of mobile phone radiation among students at Universitas Abdurrab Pekanbaru. The study was conducted at Universitas Abdurrab, Pekanbaru, Riau, Indonesia. Data collection was conducted online on 11 February 2026. The research was carried out from October 2025 to February 2026, including the preparation of the research proposal and data collection. The population of this study consisted of all active students at Universitas Abdurrab Pekanbaru, with a total of approximately 3,035 students. The sample size was determined using the Slovin formula with a 5% error tolerance and resulted in 354 respondents. The sampling technique

used was simple random sampling, in which each member of the population had the same opportunity to be selected.

The reported inclusion criteria were active Universitas Abdurrab students who were willing to participate. The exclusion criteria were students who were absent or ill during data collection and students who were unwilling to complete the questionnaire or submitted incomplete responses. Primary data were collected online using Google Forms. The questionnaire used in this study was based on research that has been done by Ulfah and consisted of 20 true/false questions about knowledge of the health risks of mobile phone radiation. Secondary data was obtained from the internet and library sources.

Each correct answer was given a score of 1 and each incorrect answer was given a score of 0. The total score was calculated and converted into a percentage. Knowledge was classified into three categories: good (≥76%), moderate (56–75%), and poor (≤55%).

Data Processing and Statistical Analysis

The collected data were checked for completeness, coded, scored, and tabulated. The data were then analyzed descriptively using frequency and percentage distributions to describe respondent characteristics and the level of knowledge.

RESULT DAN DISCUSSION

Results

A total of 354 respondents completed the questionnaire. The respondents were predominantly 21 years old, female, and enrolled in the Bachelor of Pharmacy program.

Table 1. Demographic characteristics of respondents (n=354).

Characteristic	Category	n (%)
Age	21 years	196 (55.36)
	22 years	128 (36.15)
	23 years	30 (8.47)
Gender	Male	82 (23.16)
	Female	272 (76.83)
Study program	Bachelor of Pharmacy	112 (31.64)
	Bachelor of Midwifery	76 (21.47)
	Diploma IV Medical Laboratory Technology	67 (18.92)
	Diploma III Nursing	35 (9.88)
	Bachelor of Informatics Engineering	33 (9.32)
	Bachelor of Government Science	31 (8.75)

Table 2. Knowledge regarding potential health risks associated with mobile phone radiation (n=354).

Knowledge category	n	%
Good	95	26.84
Moderate	157	44.35
Poor	102	28.81
Total	354	100.00

The largest group of respondents had moderate knowledge, with 157 respondents (44.35%), followed by poor knowledge with 102 respondents (28.81%) and good knowledge with 95 respondents (26.84%). This shows that the level of knowledge about the health risks of mobile phone radiation among students was mostly in the moderate category.

The results showed that most respondents had moderate knowledge. This result is in line with the preliminary interview involving eight students, in which only two students knew about the health risks of mobile phone radiation and six students did not. The results indicate that students already have some information about the topic, but their knowledge has not reached the good category.

The result should also be interpreted in the context of the distinction between mobile-phone use and RF-EMF exposure. Students may encounter information about headaches, sleep problems, eye strain, or musculoskeletal symptoms in relation to smartphones, but these outcomes can arise through different mechanisms. For example, systematic reviews have identified associations between smartphone use or problematic smartphone use and sleep quality, while research on digital eye strain has linked prolonged digital-device exposure with ocular and non-ocular symptoms [1,18–23]. These findings do not demonstrate that RF-EMF itself caused those outcomes.

Several studies have discussed the health effects of radiofrequency electromagnetic fields and mobile phone use. The findings are still varied, and not all reported health effects have been established as being caused by mobile phone radiation. Therefore, health education should provide balanced information and explain the difference between radiofrequency radiation and other effects related to prolonged mobile phone use, such as sleep disturbance, eye strain, and musculoskeletal discomfort.

The moderate level of knowledge may be related to the information received by students. Students may obtain information from social media, the internet, friends, or other sources, and the information may not always be complete or scientifically accurate. This study did not examine the sources of information used by respondents. Further research can examine the sources of information and the students' understanding of mobile phone radiation and health.

The findings are also relevant to nursing education and health promotion. Students use mobile phones frequently for academic and communication activities. Health education can provide practical information about using mobile phones wisely, limiting prolonged screen time, taking breaks, maintaining proper posture, and obtaining health information from reliable sources.

This study provides information about the level of knowledge regarding the health risks of mobile phone radiation among students at Universitas Abdurrab. The results can be used as baseline information for health education programs and for further research.

For nursing and health promotion, the results can be used to develop simple educational materials for students. Education can focus on the health effects discussed in the literature, appropriate mobile phone use, screen time, eye health, sleep, and ways to obtain reliable health information.

This study has several limitations. The descriptive design does not allow causal conclusions. Data were collected using an online questionnaire, so the results depend on the respondents' understanding and honesty in answering the questions. The study measured knowledge and did not measure actual radiation exposure, health conditions, or mobile phone use behavior. The study was also conducted at one university, so the results may not represent students in other universities. Further research should develop and test the validity and reliability of the questionnaire. Future studies can also examine the relationship between knowledge and mobile phone use, screen time, sleep, eye health, and musculoskeletal complaints. Health education interventions can also be conducted to determine whether structured education can improve students' knowledge.

CONCLUSION

Based on the results of the study conducted on 11 February 2026, among 354 respondents, 95 respondents (26.84%) had good knowledge, 157 respondents (44.35%) had moderate knowledge, and 102 respondents (28.81%) had poor knowledge. Most students therefore had a moderate level of knowledge about the health risks of mobile phone radiation. Educational institutions are expected to provide additional information about the appropriate use of mobile phones and the possible health effects associated with prolonged use. Students are expected to increase their knowledge and use mobile phones wisely, including limiting prolonged use, taking breaks, and obtaining health information from reliable sources.

AUTHOR CONTRIBUTION

Andalia Roza: supervision, methodology, and manuscript review. Habibi Rachman: data collection, data analysis, and manuscript preparation. Both authors approved the final manuscript.

ACKNOWLEDGEMENT

The authors thank Universitas Abdurrab and all students who participated in this study. The authors also thank everyone who supported the completion of this research.

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