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ASSOCIATION OF SMARTPHONE ADDICTION WITH DEMOGRAPHIC FACTORS AMONG UNDERGRADUATE NURSING STUDENTS IN TWIN CITIES: A CROSS-SECTIONAL STUDY

Original Research

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Acknowledgement: The authors express their gratitude to all participants and institutions for their valuable contribution to this study.

Conflict of Interest: None
Grant Support & Financial Support: None

ABSTRACT

Background: Smartphones have become an integral part of daily life, offering numerous benefits in communication, education, and professional development. However, excessive use can lead to smartphone addiction, a behavioral condition characterized by compulsive usage, withdrawal symptoms, and functional impairment. Among university students, particularly those in healthcare fields, the rising trend of smartphone dependency has raised concerns regarding its impact on academic performance, mental well-being, and social interactions. Understanding the demographic factors influencing smartphone addiction is essential for developing targeted intervention strategies.

Objective: To assess the prevalence of smartphone addiction and examine its association with demographic variables, including age, gender, and academic year, among undergraduate nursing students.

Methods: A cross-sectional study was conducted in two nursing institutes in the twin cities of Pakistan. A total of 187 undergraduate nursing students were recruited using a convenience sampling technique. Data were collected through the Smartphone Addiction Scale (SAS), a validated instrument with high internal reliability (Cronbach's alpha = 0.96). Statistical analysis was performed using SPSS version 27.0. Descriptive statistics were used to summarize demographic characteristics and addiction levels. The chi-square test was applied to determine associations between smartphone addiction and demographic variables, with a significance level set at $p < 0.05$.

Results: Among the participants, 105 (56.1%) were aged 18-21 years, and 82 (43.9%) were aged 22-25 years. Female students accounted for 117 (62.6%), while male students comprised 70 (37.4%). Addiction levels revealed that 132 (70.6%) exhibited moderate addiction, 29 (15.5%) had severe addiction, and 26 (13.9%) had mild addiction. A significant association was found between smartphone addiction and gender ($p = 0.023$), with males showing a higher prevalence of severe addiction (22.9%) than females (11.1%). Academic year also showed a significant correlation ($p = 0.001$), with second-year students demonstrating the highest rates of mild (27.0%) and severe addiction (20.6%). However, no significant association was observed between age and smartphone addiction ($p = 0.070$).

Conclusion: This study highlights the widespread prevalence of moderate smartphone addiction among undergraduate nursing students and its significant association with gender and academic year. These findings underscore the need for targeted awareness programs and behavioral interventions to promote responsible smartphone usage. Collaborative efforts involving educators, administrators, and parents are essential in fostering digital well-being among future healthcare professionals.

Keywords: Academic performance, Behavioral addiction, Cross-sectional study, Nursing students, Smartphone addiction, Technology dependence, University students.

INTRODUCTION

The 21st century has been marked by unprecedented technological advancements that have transformed various aspects of daily life, with smartphones playing a particularly pivotal role. These portable devices integrate multiple functions, including communication, social networking, and web-based applications, making them indispensable in both personal and professional spheres. Among younger demographics, particularly university students, smartphones have become a primary means of accessing information, facilitating academic activities, and maintaining social interactions. However, excessive and compulsive smartphone use has raised concerns regarding its potential classification as an addiction, a condition characterized by compulsive engagement, tolerance, withdrawal symptoms, and functional impairment, akin to behavioral addictions described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (1). This issue is particularly relevant to healthcare students, including those pursuing nursing education, who face significant academic and clinical demands that may predispose them to problematic smartphone use (2).

Recent studies highlight an increasing trend in smartphone dependency, with individuals spending more than 20 hours per week on their devices exhibiting notable signs of addiction (3). Among students, excessive smartphone use has been associated with impaired concentration, diminished academic performance, and reduced attentiveness during lectures (4). Nursing students, in particular, are at a higher risk due to the stress inherent in their rigorous training, which may drive them towards smartphone use as a coping mechanism (5). Research suggests that prolonged smartphone usage can lead to both physical and psychological consequences, including musculoskeletal discomfort, digital eye strain, sleep disturbances, and emotional instability (6). Furthermore, smartphone addiction has been linked to reduced interpersonal competence among nursing students, affecting their ability to communicate effectively in clinical settings (7). While some literature emphasizes the positive aspects of smartphone use in nursing education, such as its utility as a learning aid, it is imperative to acknowledge the negative implications as well. The behavioral patterns associated with smartphone addiction also vary based on gender, with studies indicating that female students exhibit higher addiction rates compared to their male counterparts, possibly due to differential usage preferences—social media engagement versus gaming tendencies (8, 9).

Despite the growing body of research exploring smartphone addiction, a notable gap remains in literature specifically examining its prevalence and associated demographic factors among undergraduate nursing students in Pakistan. Given the critical role of nurses in healthcare delivery, understanding the extent of smartphone addiction in this cohort is essential for developing strategies that foster balanced technology use while ensuring academic and professional competence. This study aims to evaluate the prevalence of smartphone addiction among nursing students and examine its association with key demographic variables. By identifying patterns of smartphone dependence within this population, the research seeks to provide evidence-based insights that may inform policy recommendations and interventions promoting healthier smartphone usage habits among future healthcare professionals (10).

METHODS

An analytical cross-sectional study was conducted to assess the association between smartphone addiction and demographic factors among undergraduate nursing students in two nursing institutes located in the twin cities of Pakistan. The target population comprised students enrolled in the Generic Bachelor of Science in Nursing (BSN) program. A convenience sampling technique was employed to recruit participants. The required sample size was calculated using the Raosoft sample size calculator, considering a 5% margin of error and a 95% confidence interval, yielding a sample size of 187. To account for potential participant dropout, a 10% attrition rate was applied. The inclusion criteria encompassed undergraduate nursing students from the 2nd, 3rd, and 4th years who owned a smartphone, while newly enrolled 1st-year students were excluded due to their transitional phase, which could significantly influence their smartphone usage patterns.

Data collection was performed using the Smartphone Addiction Scale (SAS), an established and validated instrument originally developed by Kwon et al. (2013), with a high internal consistency reliability (Cronbach's alpha = 0.96) (11). The questionnaire consisted of two sections: the first captured demographic information, including age, gender, and academic year, while the second comprised the SAS, consisting of 33 items categorized into six domains: overuse, tolerance, withdrawal, positive anticipation, disruption to daily life, and cyberspace-oriented connection. Each item was rated on a six-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly

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agree), with total scores ranging from 33 to 198. Higher scores reflected greater levels of smartphone addiction, categorized into three levels: mild (33-88), moderate (89-143), and severe (144-198).

Ethical approval for the study was granted by the Institutional Ethical Committee of the National University of Medical Sciences, Rawalpindi (Reference: 424-AAA-ERC-AFPGMI). Written permission was obtained from the relevant authorities, and informed consent was secured from all participants before data collection. Students were fully briefed about the study's objectives, and confidentiality was assured. Statistical analysis was conducted using SPSS version 27.0. Categorical data were presented as frequencies and percentages. The chi-square test was applied to determine associations between smartphone addiction and demographic variables.

RESULTS

The study analyzed the association between smartphone addiction and demographic characteristics among undergraduate nursing students. The majority of participants (56.1%) were aged 18 to 21 years, while 43.9% were between 22 to 25 years. Female students constituted 62.6% of the sample, whereas 37.4% were male. The sample was distributed across academic years, with 33.7% each from the 2nd and 4th years and 32.6% from the 3rd year. Smartphone addiction levels indicated that 70.6% of students exhibited moderate addiction, 15.5% showed severe addiction, and 13.9% had mild addiction. Gender was significantly associated with addiction levels ($p = 0.023$), with males displaying a higher prevalence of severe addiction (22.9%) compared to females (11.1%). Academic year also showed a significant correlation ($p = 0.001$), where 2nd-year students reported the highest rates of mild (27.0%) and severe addiction (20.6%), while 3rd-year students predominantly had moderate addiction (82.0%). However, age was not significantly associated with addiction ($p = 0.070$).

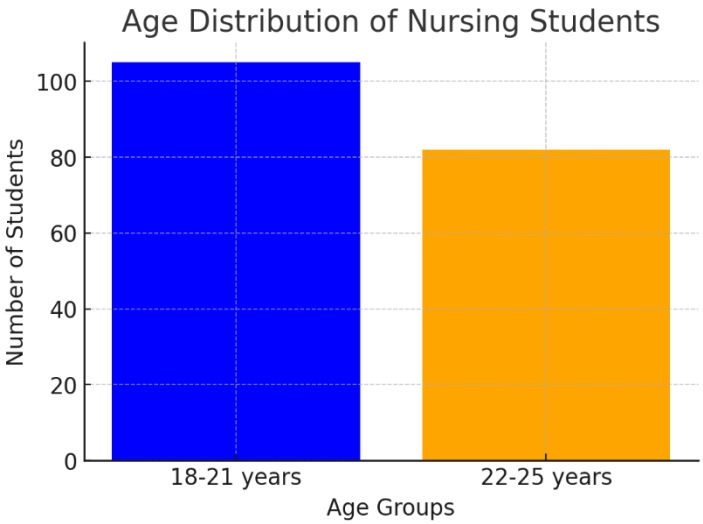

Figure 1 Age Distribution of Nursing Students

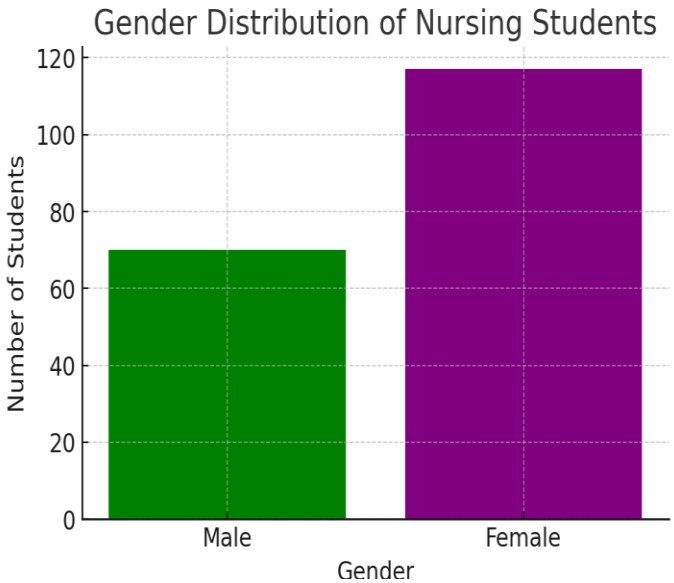

Figure 3 Gender Distribution of Nursing Students

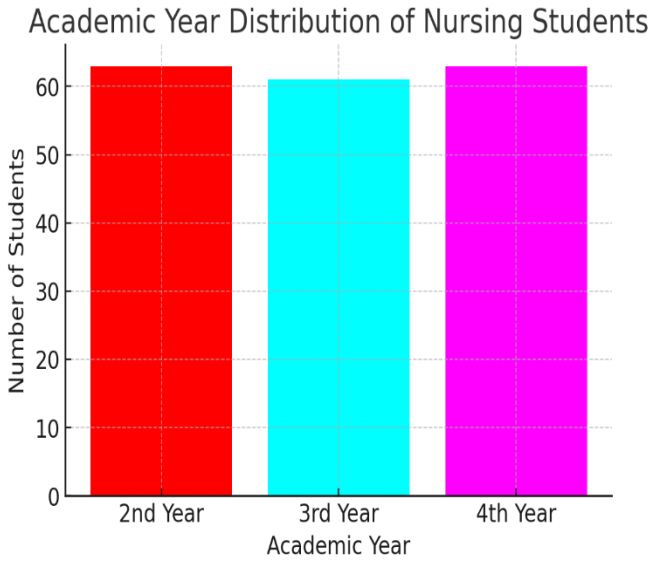

Figure 2 Academic Year Distribution of Nursing Students

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Table 1: Demographic Characteristics of the Study Participants

Characteristics	Variables	Frequency	Percentages
Age	18 to 21 years	105	56.1
	22 to 25 years	82	43.9
	Total	**187**	**100**
Gender	Male	70	37.4
	Female	117	62.6
	Total	**187**	**100**
Academic Year	2rd year	63	33.7
	3rd year	61	32.6
	4th year	63	33.7
	Total	**187**	**100**

Table 01 shows that majority of the participants105 (56.1%) fell into 18 to 21 years of age while 82 (43.9%) were in the range of 22 to 25 years of age. There were 70 (37.4%) male student nurses and 117 (62.6%) female student nurses. The sample was evenly distributed across the academic years, comprising 63 participants (33.7%) from the 2nd year, 61 participants (32.6%) from the 3rd year, and 63 participants (33.7%) from the 4th year.

Table 2: Frequency and Percentage Distribution of Smartphone Addiction

Level of addiction	**Frequency (f)**	**Percentage (%)**
Mild Addiction	26	13.9
Moderate addiction	132	70.6
Severe Addiction	29	15.5

Table 2 represents the frequency distribution of using smartphone among students. A significant majority of students, 132 individuals (70.6%), exhibit moderate smartphone addiction. Additionally, 29 students (15.5%) experience severe addiction, while 26 students (13.9%) have mild addiction.

Table 3: Association of smartphone addiction with demographic variables

Variables	**Characteristics**	**Mild Addiction**	**Moderate Addiction**	**Severe Addiction**	**p-value**
Age	18 to 21 years	20 (19.0%)	70 (66.7%)	15 (14.3%)	.070
	22 to 25 years	6 (7.3%)	62 (75.6%)	14 (17.1%)	
Gender	Male	5 (7.1%)	49 (70%)	16 (22.9%)	.023
	Female	21 (17.9%)	83 (70.9%)	13 (11.1%)	
Academic year	2nd year	17 (27.0%)	33 (52.4%)	13 (20.6%)	.001
	3rd year	4 (6.6%)	50 (82.0%)	7 (11.5%)	
	4th year	5 (7.9%)	49 (77.8%)	9 (14.3%)	

Chi-square test applied. P < 0.05 is regarded as significant.

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Table 3 reveals the association of smartphone addiction with demographic variables such as age, gender and academic year. Association between smartphone addiction levels (mild, moderate, severe) and demographic factors among undergraduate nursing students revealed that age is not significantly linked to addiction ($p = 0.070$), as both age groups (18-21 and 22-25 years) show similar distributions. In contrast, gender is significantly associated ($p = 0.023$), with males reporting a higher rate of severe addiction (22.9%) compared to females (11.1%). Academic year was also significantly associated ($p = 0.001$), with 2nd-year students showing the highest levels of mild (27.0%) and severe addiction (20.6%) while 3rd and 4th-year students were more prone to moderate addiction as presented in Table 3.

DISCUSSION

The study assessed smartphone addiction and its association with demographic variables among undergraduate nursing students, revealing that the majority (70.6%) exhibited moderate smartphone addiction. This pattern aligns with previous research, where similar findings were reported among university students, particularly those in healthcare disciplines (12). The results indicated that a considerable proportion of students (15.5%) experienced severe addiction, which can have implications for their academic performance, mental well-being, and overall productivity. Gender differences were notable, with male students demonstrating a significantly higher prevalence of severe addiction (22.9%) compared to females (11.1%), consistent with findings from previous studies that suggest males are more prone to excessive smartphone use due to engagement in gaming and entertainment applications (13). However, contrasting literature indicates that females often exhibit higher addiction scores due to their greater involvement in social media and online communication (14). These variations could be attributed to differing behavioral patterns, coping mechanisms, and sociocultural factors influencing smartphone use. The academic year was also significantly associated with addiction levels, with second-year students exhibiting the highest proportion of mild addiction (27.0%), while third- and fourth-year students were more inclined towards moderate addiction. The increasing academic demands, clinical responsibilities, and reliance on digital resources among senior students may contribute to this trend, emphasizing the importance of interventions to promote responsible smartphone use (15).

Age did not show a significant correlation with smartphone addiction ($p = 0.070$), indicating that addiction patterns were relatively consistent across different age groups. However, within the 22-25 age group, a slightly higher proportion (17.1%) exhibited severe addiction, reinforcing previous research suggesting that older students may develop stronger habitual reliance on digital devices for academic and social purposes (16). The gender-based differences in addiction rates also support findings that males engage more frequently in smartphone-related activities associated with dependency, such as online gaming and streaming, whereas females are more likely to use smartphones for social interaction and educational purposes (17). Some studies suggest that cultural expectations, social norms, and psychological factors influence gender-related smartphone addiction patterns, reinforcing the need for gender-specific strategies to address problematic smartphone use (18). Despite significant associations between gender and academic year with smartphone addiction, other sociodemographic factors may play a less pronounced role. Some studies have failed to establish strong links between addiction and demographic characteristics, suggesting that personal habits, psychological predispositions, and environmental influences may contribute more significantly to excessive smartphone use (19).

The strengths of this study include the use of a validated assessment tool, the Smartphone Addiction Scale (SAS), which has been widely utilized in similar research, ensuring the reliability of findings. Additionally, the study provides valuable insights into smartphone addiction trends among nursing students, contributing to the growing body of evidence on digital dependency in healthcare education (20). However, certain limitations must be acknowledged. The study was confined to two institutions, limiting the generalizability of findings to a broader population of nursing students. Furthermore, the cross-sectional nature of data collection precludes the establishment of causal relationships between smartphone addiction and demographic factors (21). Future research should consider a multi-institutional approach with a larger sample size to improve the external validity of findings. Longitudinal studies may also provide deeper insights into addiction progression and its long-term impact on academic performance, mental health, and social functioning (22).

Understanding the implications of smartphone addiction is crucial for developing preventive and intervention strategies. Institutions must implement awareness programs to educate students on responsible smartphone use, incorporating behavioral interventions to mitigate excessive dependency. Encouraging students to balance digital engagement with academic responsibilities and physical activities can help minimize the adverse effects of smartphone addiction. Faculty members and administrators should integrate digital well-being initiatives into curricula, promoting mindful technology use while leveraging its advantages for educational purposes (23). Given the significant association of gender and academic year with smartphone addiction, targeted interventions addressing specific risk

groups may prove effective. Addressing smartphone addiction in nursing education is particularly critical, as excessive dependency can impact cognitive function, stress levels, and interpersonal communication skills essential for clinical practice (24). Collaborative efforts from educators, mental health professionals, and policymakers are necessary to develop comprehensive frameworks that foster a healthier digital environment for students (25).

A recent cross-sectional study conducted by Celikkalp et al. (2020) examined smartphone addiction levels among nursing and medical students, revealing that 48.6% of female and 42.8% of male students were classified as addicted, with overall addiction levels being low. This study also found that increased smartphone use negatively impacted students' academic performance and social interactions. The researchers utilized the Smartphone Addiction Scale-Short Version (SAS-SV) to assess addiction levels and observed that excessive smartphone use was associated with decreased study time and lower academic achievement. These findings underscore the importance of monitoring smartphone usage among healthcare students to prevent potential adverse effects on their education and social lives (26).

CONCLUSION

The findings of this study highlight the prevalent issue of smartphone addiction among undergraduate nursing students, emphasizing its association with demographic factors such as gender and academic year. While age did not show a strong correlation, the results suggest that patterns of smartphone dependency are influenced by specific demographic characteristics. Given the increasing reliance on digital devices in both academic and social contexts, it is essential to recognize the potential impact of excessive smartphone use on students' well-being and professional development. Addressing this concern requires targeted interventions that promote balanced smartphone usage, integrating awareness programs and behavioral strategies within educational institutions. Faculty members, administrators, and parents play a crucial role in guiding students toward healthier digital habits, ensuring that technology remains a tool for academic and professional enhancement rather than a source of distraction or dependency. By fostering responsible smartphone use, institutions can contribute to the overall well-being and academic success of future healthcare professionals.

AUTHOR CONTRIBUTIONS

Author	Contribution
Azra Mahmood	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Fouzia Jabeen	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Tayyaba Tajamal*	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Asifa Jamil	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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