

Original Article

Digital Distraction in Nursing Education: Prevalence of Smartphone Use and Its Association with Classroom Distraction Among Undergraduate Nursing Students in Pakistan

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ABSTRACT

Background: The widespread adoption of smartphones among university students has transformed educational environments by providing immediate access to digital resources and communication platforms. However, frequent smartphone use during classroom sessions may contribute to digital distraction, reduced attention, and diminished academic engagement, particularly in professional disciplines such as nursing where sustained concentration is essential for learning complex theoretical concepts. **Objective:** To determine the prevalence of smartphone use during lectures and examine its association with classroom distraction among undergraduate nursing students in Mirpurkhas, Pakistan. **Methods:** A cross-sectional analytical study was conducted among 272 undergraduate nursing students from three nursing institutes in Mirpurkhas, Sindh. Data were collected using a structured self-administered questionnaire assessing demographic characteristics, frequency of smartphone use during lectures, percentage of class time spent using mobile devices, and levels of classroom distraction measured on a five-point Likert scale. Descriptive statistics were used to summarize frequencies and percentages. Chi-square test, Spearman rank correlation, and binary logistic regression were performed using SPSS version 26 to examine the relationship between smartphone use and classroom distraction, with a significance level set at $p < 0.05$. **Results:** Smartphone use during lectures was highly prevalent, with 43.0% of students reporting using their phones 1–10 times per class and 28.3% reporting more than 30 uses per session. A significant association was found between smartphone use frequency and classroom distraction ($\chi^2 = 27.11, p = 0.007$). Spearman correlation indicated a positive but weak relationship between phone use and distraction levels ($r = 0.231, p < 0.001$). Logistic regression analysis demonstrated that increased smartphone use significantly predicted higher classroom distraction (OR = 1.37, 95% CI: 1.11–1.69, $p = 0.003$). **Conclusion:** Smartphone use during classroom sessions is common among nursing students and is significantly associated with increased classroom distraction. Implementing structured institutional policies and promoting responsible smartphone use may help reduce digital distractions and improve student engagement in nursing education.

Keywords: Smartphone use; classroom distraction; nursing students; digital distraction; learning engagement; nursing education.

INTRODUCTION

The widespread integration of digital technologies into higher education has transformed how students access information, communicate, and engage with academic content. Among these technologies, smartphones have become one of the most commonly used personal devices by university students worldwide. Their portability, internet connectivity, and multifunctionality allow students to access digital textbooks, academic databases, learning management systems, and educational applications in real time. These capabilities have created new opportunities for mobile-assisted learning and flexible access to educational

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resources within and beyond the classroom environment (2). As a result, smartphones are increasingly present during lectures and other instructional activities in higher education institutions.

Despite their potential academic benefits, smartphones also introduce challenges related to digital distraction and multitasking in classroom settings. Students frequently use mobile devices during lectures for both academic and non-academic purposes, including messaging, social media engagement, entertainment browsing, and gaming. Such multitasking behaviors can fragment attention and interrupt the cognitive processes required for comprehension and information retention. Previous studies have shown that off-task mobile phone use during lectures is associated with reduced concentration, diminished note-taking efficiency, and lower engagement with course material (3,13). Experimental research has further demonstrated that students who actively use mobile phones during instructional time may perform worse on measures of lecture comprehension compared with those who refrain from device use (3).

The mechanisms underlying these effects can be explained through cognitive and behavioral perspectives on learning. Digital multitasking requires students to shift attention repeatedly between academic content and smartphone-related activities, increasing cognitive load and reducing the mental resources available for processing instructional material. Evidence from educational technology research indicates that frequent interruptions caused by digital notifications or task switching can impair information processing and hinder knowledge consolidation (4). Furthermore, the presence of smartphones within reach may itself act as a source of attentional competition, even when the device is not actively used (11). Consequently, smartphone-related distractions can influence both individual learning outcomes and the broader classroom environment.

In addition to affecting individual attention, smartphone use can also disrupt the learning experiences of surrounding students. Mobile device notifications, screen illumination, and visible online activities may create visual and auditory distractions that interrupt the concentration of nearby learners. Such environmental disruptions may reduce overall classroom engagement and interfere with the instructional atmosphere. Studies examining digital distractions in higher education classrooms have reported that even passive exposure to others' mobile phone use can negatively influence students' ability to sustain attention during lectures (10). These findings suggest that smartphone use may represent a broader pedagogical challenge that extends beyond individual behavior to affect collective learning environments.

The implications of smartphone-related distraction may be particularly significant in healthcare education programs such as nursing. Nursing students must develop a strong foundation in theoretical knowledge while simultaneously cultivating critical thinking and clinical decision-making skills. Effective learning in such programs requires sustained attention, active engagement with instructional content, and the ability to integrate complex medical concepts. Distractions during lectures may hinder the acquisition of essential nursing competencies and may ultimately influence students' readiness for clinical practice (14). Therefore, understanding how digital technologies influence learning environments in nursing education is an important issue for educators and academic policymakers.

A growing body of international literature has explored the relationship between smartphone use and academic outcomes among university students. Research suggests that excessive or unregulated mobile phone use during lectures is associated with decreased academic engagement and lower learning efficiency (6). Systematic reviews examining digital distraction in educational settings have also highlighted the need for balanced

approaches that acknowledge both the educational benefits and potential drawbacks of mobile technology in classrooms (9). While smartphones can support quick access to clinical guidelines, digital textbooks, and collaborative learning platforms, unstructured or non-academic use may contribute to attentional disruptions during instructional sessions.

Within Pakistan, smartphone ownership among university students has increased substantially over the past decade, reflecting broader global trends in digital connectivity. Several studies conducted in Pakistani university populations have reported associations between smartphone overuse, reduced concentration, and academic difficulties (5,14). However, most available research has focused on general university populations or students in large metropolitan institutions. Empirical evidence examining smartphone-related classroom distraction specifically among nursing students in smaller cities remains limited. Differences in institutional policies, technological infrastructure, and classroom learning environments may influence patterns of mobile phone use and its educational implications across diverse regional contexts.

Mirpurkhas, a developing urban center in Sindh province, hosts several nursing institutes that train undergraduate students for healthcare professions. Despite the increasing presence of smartphones in educational settings, limited research has investigated how frequently nursing students in such institutions use mobile devices during lectures and how this behavior relates to perceived classroom distraction. Understanding these patterns is important for informing evidence-based classroom policies and educational strategies that balance the benefits of digital technology with the need to maintain focused learning environments.

Given the growing reliance on mobile technology in higher education and the potential for digital distractions during instructional sessions, there is a need for locally relevant empirical evidence examining these dynamics within nursing education programs. Assessing the prevalence of mobile phone use during lectures and evaluating its association with students' perceived classroom distraction can provide valuable insights for educators and policymakers seeking to optimize learning environments.

Therefore, the present study aimed to determine the prevalence of mobile phone use during classroom sessions and to examine its association with perceived classroom distraction among undergraduate nursing students enrolled in selected nursing institutes in Mirpurkhas, Pakistan (19). It was hypothesized that higher frequency of mobile phone use during lectures would be associated with greater levels of self-reported classroom distraction among nursing students.

METHODS

A cross-sectional analytical study was conducted to examine the prevalence of mobile phone use during classroom sessions and its association with perceived classroom distraction among undergraduate nursing students. The cross-sectional design was selected because it allows the simultaneous assessment of exposure and outcome variables within a defined population at a specific point in time and is commonly used in educational and behavioral research to explore associations between technology use and learning-related outcomes (20). This design was appropriate for estimating the distribution of smartphone use behaviors during lectures and for evaluating their relationship with self-reported classroom distraction in an academic setting.

The study was carried out in three nursing institutes located in Mirpurkhas, Sindh, Pakistan, including one public and two private colleges offering Bachelor of Science in Nursing (BSN)

programs. Data collection was conducted between November 2025 and February 2026 during scheduled academic sessions. Undergraduate students enrolled in the BSN program constituted the study population. Eligible participants were students aged 17–30 years who were actively attending classroom lectures during the data collection period and who owned or regularly used a mobile phone. Students who were absent on the day of data collection, those who declined participation, and postgraduate nursing students were excluded from the study. A convenience sampling approach was employed to recruit participants from different academic years to ensure representation across all stages of the undergraduate nursing program.

Participants were approached in their respective classrooms after obtaining institutional permission from the participating nursing institutes. The purpose and procedures of the study were explained verbally to students, and written informed consent was obtained prior to participation. Participation was voluntary and anonymous, and students were informed that they could decline participation or withdraw at any time without academic consequences. Questionnaires were distributed in paper format and completed by students during a designated period following lectures to minimize disruption of instructional activities.

Data were collected using a structured self-administered questionnaire adapted from a previously published instrument designed to assess mobile phone use and distraction during learning sessions (19). Minor contextual modifications were made to ensure relevance to undergraduate nursing students and the local educational setting. The questionnaire consisted of close-ended items organized into four domains: demographic characteristics, patterns of mobile phone use during lectures, perceived classroom distraction associated with mobile phone use, and students' perceptions of institutional policies regulating smartphone use during classroom sessions. The demographic section collected information on gender and year of study. The mobile phone usage section assessed the frequency of phone use during lectures and the proportion of classroom time spent using mobile devices. The classroom distraction section evaluated the level of distraction experienced due to personal phone use and distraction caused by other students' device use. The final section examined students' perceptions regarding the presence and usefulness of institutional policies regulating mobile phone use during lectures.

Perceived classroom distraction was measured using a five-point Likert scale ranging from 1 (no distraction) to 5 (totally distracted). Higher scores indicated greater perceived distraction during classroom sessions. For inferential analysis, distraction scores were dichotomized into low distraction (scores 1–2) and high distraction (scores 3–5) to facilitate logistic regression modeling. Mobile phone use frequency during lectures was categorized into four levels: 1–10 times, 11–20 times, 21–30 times, and more than 30 times per class session. The percentage of classroom time spent using mobile devices was categorized into three groups: 1–25%, 26–50%, and 51–75%. Independent variables included mobile phone use frequency and the proportion of class time spent using mobile devices, while the primary dependent variable was the level of classroom distraction. Gender and academic year were considered potential confounding variables because prior educational research suggests that technology use patterns and learning behaviors may vary across demographic and academic characteristics (21).

The reliability and validity of the data collection instrument were evaluated to ensure measurement consistency and contextual appropriateness. Content validity had been established in the original study through expert review, and the adapted questionnaire was reviewed by nursing education experts to ensure clarity and relevance to the local academic

context. Internal consistency reliability was assessed using Cronbach's alpha coefficient calculated in SPSS, with a value of 0.81 indicating good reliability for the distraction-related items in the study population.

To minimize potential sources of bias, several methodological steps were implemented. Anonymous self-administered questionnaires were used to reduce social desirability bias and encourage honest responses regarding mobile phone use during lectures. Data were collected during regular academic sessions to capture typical classroom behaviors and reduce recall bias. Standardized instructions were provided to all participants, and questionnaires were administered in a consistent manner across all participating institutes. Potential confounding effects of gender and academic year were accounted for in multivariable statistical analyses.

The required sample size was estimated using the Rao Soft sample size calculator assuming a 95% confidence level and a 5% margin of error. Based on the estimated population of undergraduate nursing students across the selected institutes, the minimum required sample size was calculated as 272 participants. This sample size was considered adequate to estimate the prevalence of smartphone use during lectures and to detect statistically meaningful associations between mobile phone use and classroom distraction with acceptable precision in cross-sectional observational studies (22).

All completed questionnaires were checked for completeness before data entry. Data were entered into Microsoft Excel and subsequently imported into IBM SPSS Statistics version 26 (IBM Corp., Armonk, NY, USA) for statistical analysis. Descriptive statistics were calculated to summarize demographic characteristics and patterns of mobile phone use. Frequencies and percentages were reported for categorical variables. The association between mobile phone use frequency and levels of classroom distraction was assessed using the chi-square test of independence. Spearman's rank correlation analysis was performed to examine the relationship between frequency of phone use and distraction scores because the variables were ordinal in nature. Binary logistic regression analysis was conducted to identify predictors of high classroom distraction while adjusting for potential confounding variables including gender and academic year. Adjusted odds ratios with 95% confidence intervals were calculated to quantify the strength of associations. A p-value of less than 0.05 was considered statistically significant (23). Data completeness was verified before analysis, and only fully completed questionnaires were included in the final dataset to ensure analytical consistency.

Ethical approval for the study was obtained from the Ethical Review Committee of the College of Nursing Female, Mirpurkhas (approval number 26/ERC/03). The study was conducted in accordance with established ethical principles for research involving human participants, including voluntary participation, confidentiality of collected information, and protection of participant anonymity. Written informed consent was obtained from all participants prior to data collection. No personal identifiers were collected, and data were stored securely with access limited to the research team. These procedures ensured the integrity of the research process and facilitated reproducibility of the study methods in similar educational settings (24).

RESULTS

Among the 272 undergraduate nursing students included in the analysis, females comprised 206 participants (75.7%) and males 66 (24.3%). Students were represented across all four years of the BSN program, with 84 students in the fourth year (30.9%), 78 in the first year (28.7%), 56 in the third year (20.6%), and 54 in the second year (19.9%). When distraction was

dichotomized into low versus high levels, high classroom distraction was reported by 122 of 206 female students (59.2%) and 37 of 66 male students (56.1%). This difference was not statistically significant ($p = 0.412$). Similarly, the proportion reporting high distraction was relatively comparable across academic years, ranging from 55.4% in third-year students to 61.9% in fourth-year students, with no significant association between year of study and classroom distraction ($p = 0.284$). These findings suggest that the observed distraction pattern was not meaningfully explained by basic demographic or academic characteristics.

Mobile phone use during classroom sessions was highly prevalent. Of the total sample, 117 students (43.0%) reported using their phones between 1 and 10 times per class, 52 (19.1%) reported 11–20 uses, 26 (9.6%) reported 21–30 uses, and 77 (28.3%) reported using their phones more than 30 times during a lecture. Thus, nearly two-fifths of the sample, specifically 103 of 272 students (37.9%), used their mobile phones more than 10 times during class, and more than one-quarter exceeded 30 uses per session. With regard to time spent on mobile devices during lectures, 163 students (59.9%) reported using them for 1%–25% of class time, 80 (29.4%) for 26%–50%, and 29 (10.7%) for 51%–75% of class time. Combined, 109 students (40.1%) spent more than one-quarter of lecture time using mobile devices, indicating that nontrivial in-class phone engagement was common in this cohort.

The distribution of high classroom distraction increased across categories of mobile phone use frequency. Among students who used their phones 1–10 times per class, 56 of 117 (47.9%) reported high distraction. This proportion rose to 34 of 52 (65.4%) among those using phones 11–20 times, to 18 of 26 (69.2%) among those using them 21–30 times, and to 51 of 77 (66.2%) among students reporting more than 30 uses per class. The overall association between frequency of mobile phone use and classroom distraction was statistically significant ($\chi^2 = 27.11$, $p = 0.007$). Compared with the reference group of 1–10 uses per class, the odds of high distraction were higher in students using their phones 11–20 times (OR = 1.77, 95% CI: 0.93–3.37), 21–30 times (OR = 2.24, 95% CI: 0.95–5.27), and more than 30 times (OR = 2.13, 95% CI: 1.17–3.86). This pattern indicates a graded increase in distraction with more frequent classroom phone use, with the clearest elevation observed in the group reporting more than 30 uses per lecture.

A similar trend was observed for the proportion of class time spent using mobile devices. Among students who used their phones for 1%–25% of class time, 86 of 163 (52.8%) experienced high distraction. This proportion increased to 52 of 80 (65.0%) among those using devices for 26%–50% of class time and to 21 of 29 (72.4%) among those using them for 51%–75% of class time. The association between time spent on mobile devices and distraction was statistically significant ($\chi^2 = 9.84$, $p = 0.020$). Relative to the 1%–25% group, the odds of high distraction were 1.67 times higher in the 26%–50% group (95% CI: 0.99–2.81) and 2.33 times higher in the 51%–75% group (95% CI: 1.05–5.16). These findings reinforce the interpretation that not only the frequency, but also the duration of in-class mobile phone use, is associated with greater perceived distraction.

Self-reported distraction levels showed that only 56 students (20.6%) reported no distraction, meaning that 216 of 272 students (79.4%) experienced at least some degree of classroom distraction related to mobile phone use. The largest category was “a little distraction,” reported by 75 students (27.6%), followed by “more than a little distraction” in 58 students (21.3%), “big distraction” in 50 (18.4%), and “totally distracted” in 33 (12.1%). When the upper three categories were combined to represent more substantial disruption, 141 students (51.8%) reported distraction levels of more than a little, big, or total distraction. This indicates that the burden of distraction was not limited to mild inconvenience but extended into moderate-to-severe disruption for more than half of the sample.

Distraction caused by other students' mobile phone use was also common. Only 43 students (15.8%) reported no distraction from peers' device use, whereas 103 (37.9%) reported a little distraction, 60 (22.1%) more than a little distraction, 44 (16.2%) big distraction, and 22 (8.1%) total distraction. Overall, 229 of 272 students (84.2%) were affected to some degree by others' phone use in the classroom, and 126 (46.3%) experienced at least more than a little distraction from peers. This suggests that smartphone-related distraction in the classroom is not solely an individual behavior but also a shared environmental issue affecting surrounding students.

With respect to the type of distraction, 156 students (57.4%) identified both visual and auditory distraction, making this by far the most commonly reported pattern. Visual distraction alone was reported by 55 students (20.2%), while auditory distraction alone was reported by 44 (16.2%). Only 17 students (6.2%) reported no distraction. Taken together, 211 students (77.6%) experienced at least a visual component to distraction, and 200 (73.5%) experienced at least an auditory component, whether alone or combined. The predominance of combined visual and auditory distraction suggests that mobile phones affect classroom attention through multiple simultaneous channels, such as screen exposure, message alerts, and peer interactions.

Students' perceptions regarding classroom mobile phone policies indicated broad support for regulation, though not unanimous support for prohibition. A total of 184 students (67.6%) reported that their instructors had some form of mobile phone policy in place, while 88 (32.4%) reported no such policy.

Most participants, 225 of 272 (82.7%), believed that policies limiting mobile phone use would help reduce distraction, whereas only 47 (17.3%) disagreed. By contrast, views on a complete ban were nearly evenly divided: 140 students (51.5%) supported banning mobile phones in classrooms, and 132 (48.5%) did not. These responses suggest that while students largely endorse structured limitation of phone use, they are more ambivalent about absolute prohibition.

The correlation and regression analyses further quantified the relationship between mobile phone use and classroom distraction. Spearman's rank correlation showed a weak but statistically significant positive association between frequency of phone use and distraction score ($r = 0.231$, $p < 0.001$), indicating that students who used their phones more often tended to report greater distraction.

Table 1. Demographic Characteristics of Participants and Association with High Classroom Distraction (n = 272)

Variable	Frequency (n)	Percentage (%)	High Distraction n (%)	p-value
Gender				0.412
Male	66	24.3	37 (56.1)	
Female	206	75.7	122 (59.2)	
Year of Study				0.284
1st Year	78	28.7	46 (59.0)	
2nd Year	54	19.9	30 (55.6)	
3rd Year	56	20.6	31 (55.4)	
4th Year	84	30.9	52 (61.9)	

Table 2. Patterns of Mobile Phone Use During Classroom Sessions and Association with High Classroom Distraction

Variable	Frequency (n)	Percentage (%)	High Distraction n (%)	χ^2 / OR (95% CI)	p-value
Frequency of Mobile Phone Use				$\chi^2 = 27.11$	0.007
1–10 times	117	43.0	56 (47.9)	Reference	
11–20 times	52	19.1	34 (65.4)	OR 1.77 (0.93–3.37)	
21–30 times	26	9.6	18 (69.2)	OR 2.24 (0.95–5.27)	
>30 times	77	28.3	51 (66.2)	OR 2.13 (1.17–3.86)	
Percentage of Class Time Using Mobile Devices				$\chi^2 = 9.84$	0.020
1–25%	163	59.9	86 (52.8)	Reference	
26–50%	80	29.4	52 (65.0)	OR 1.67 (0.99–2.81)	
51–75%	29	10.7	21 (72.4)	OR 2.33 (1.05–5.16)	

Table 3. Levels and Types of Classroom Distraction Associated with Mobile Phone Use

Variable	Frequency (n)	Percentage (%)
Self-Reported Learning Distraction		
No distraction	56	20.6
A little distraction	75	27.6
More than a little distraction	58	21.3
Big distraction	50	18.4
Totally distracted	33	12.1
Distraction Caused by Other Students		
No distraction	43	15.8
A little distraction	103	37.9
More than a little distraction	60	22.1
Big distraction	44	16.2
Totally distracted	22	8.1
Type of Distraction		
Visual	55	20.2
Auditory	44	16.2
Both visual and auditory	156	57.4
No distraction	17	6.2

Table 4. Students' Perceptions Regarding Institutional Policies on Mobile Phone Use

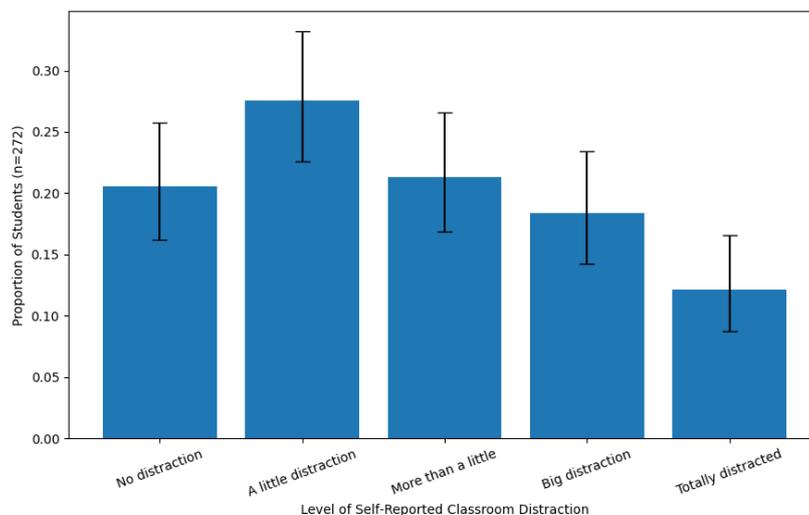
Variable	Frequency (n)	Percentage (%)
Instructor Policy on Mobile Phone Use		
Yes	184	67.6
No	88	32.4
Policy Limiting Mobile Phone Use is Helpful		
Yes	225	82.7
No	47	17.3
Should Mobile Phones be Banned in Classrooms?		
Yes	140	51.5
No	132	48.5

Table 5. Multivariable Logistic Regression Analysis Predicting High Classroom Distraction

Predictor Variable	β	Adjusted OR	95% CI	p-value
Mobile phone use frequency	0.315	1.37	1.11 – 1.69	0.003
Gender (Female vs Male)	0.094	1.10	0.63 – 1.93	0.739
Academic year	0.058	1.06	0.89 – 1.26	0.504

In the multivariable logistic regression model adjusted for gender and academic year, mobile phone use frequency remained a significant predictor of high classroom distraction ($\beta = 0.315$, adjusted OR = 1.37, 95% CI: 1.11–1.69, $p = 0.003$). This means that with each increase in category of phone-use frequency, the odds of high distraction increased by 37%.

In contrast, gender was not a significant predictor (adjusted OR = 1.10, 95% CI: 0.63–1.93, $p = 0.739$), nor was academic year (adjusted OR = 1.06, 95% CI: 0.89–1.26, $p = 0.504$). Overall, the numeric pattern across all analyses consistently indicates that more frequent and prolonged mobile phone use during lectures is associated with a higher likelihood of substantial classroom distraction among undergraduate nursing students.



The distribution of self-reported classroom distraction among undergraduate nursing students ($n=272$) demonstrates a graded pattern across distraction levels, with 27.6% reporting a little distraction, representing the largest proportion of responses, followed by 21.3% reporting more than a little distraction and 20.6% reporting no distraction. Higher-

severity distraction levels were less frequent but still substantial, with 18.4% indicating big distraction and 12.1% reporting being totally distracted during lectures. The proportional confidence intervals suggest moderate variability across categories, yet the overall distribution indicates that nearly four out of five students (79.4%) experienced at least some degree of distraction linked to smartphone presence or use in the classroom. This distribution gradient highlights a clinically relevant shift toward mild-to-moderate distraction levels rather than extreme distraction, suggesting that smartphone use more commonly produces persistent low-to-moderate attentional disruption rather than complete disengagement, which may cumulatively impair learning efficiency and cognitive processing during nursing education lectures.

DISCUSSION

The present study examined the prevalence of smartphone use and its association with classroom distraction among undergraduate nursing students in Mirpurkhas, Pakistan. The findings revealed that smartphone use during classroom sessions is highly prevalent among nursing students, with a large proportion reporting frequent device usage during lectures. Importantly, the results demonstrated a statistically significant association between the frequency of smartphone use and the level of classroom distraction. Students who reported higher frequencies of mobile phone use were more likely to experience increased levels of distraction during lectures.

These findings highlight the growing influence of digital technologies within higher education environments and underscore the potential implications of uncontrolled smartphone use on students' attentional capacity and academic engagement. The observed pattern aligns with emerging evidence indicating that smartphone use during lectures has become a routine behavior among university students worldwide, often occurring alongside traditional learning activities (20).

The prevalence of smartphone use observed in the present study is consistent with findings from international research conducted among university students in various academic disciplines. Previous studies have reported that students frequently engage with smartphones during lectures for both educational and non-academic purposes, including communication through messaging applications, browsing social networking platforms, and accessing entertainment content (21).

While smartphones provide convenient access to information and learning resources, these multitasking behaviors may divert students' attention away from lecture content. Cognitive psychology literature suggests that task-switching between learning activities and smartphone use can increase cognitive load and reduce the efficiency of information processing, thereby impairing students' ability to retain and comprehend academic material (22).

The current study also identified a positive, although relatively weak, correlation between smartphone use frequency and classroom distraction. This finding suggests that while smartphone use contributes to distraction, it is likely not the sole determinant of students' attentional difficulties during lectures.

Other contextual factors, such as instructional style, classroom engagement strategies, and students' intrinsic motivation to learn, may also influence levels of attention and distraction. Research in educational psychology has indicated that interactive teaching methods and active learning environments can mitigate the negative effects of digital distractions by maintaining students' cognitive engagement with course content (23). Therefore, the

relationship between smartphone use and classroom distraction should be interpreted within a broader educational context rather than as an isolated behavioral factor.

Another important finding of this study was that many students reported experiencing distraction caused by the mobile phone activities of their peers. This suggests that smartphone use may not only affect the individual user but may also disrupt the broader classroom environment. Visual stimuli such as illuminated screens and scrolling activity, as well as auditory signals including message notifications and alert tones, may interrupt the concentration of nearby students.

Previous research has documented similar classroom dynamics, where the presence of digital devices created secondary distractions for other students even when they themselves were not using smartphones (24). Such environmental distractions may collectively reduce the overall quality of the learning atmosphere and contribute to decreased academic engagement during lectures.

Within the context of nursing education, the implications of digital distraction may be particularly significant. Nursing students are required to develop a strong foundation of theoretical knowledge alongside critical thinking and clinical decision-making skills. Sustained attention during lectures is essential for understanding complex medical concepts and integrating theoretical knowledge with practical clinical applications. Frequent interruptions caused by smartphone use may therefore interfere with students' ability to absorb essential nursing knowledge and may ultimately influence their clinical competence and professional readiness. Previous studies in healthcare education have emphasized that attention and cognitive engagement during classroom instruction are critical components of effective learning in clinical disciplines (25).

Despite the potential negative consequences of smartphone use in academic settings, it is important to recognize that mobile devices also provide valuable educational benefits. Smartphones enable immediate access to clinical guidelines, digital textbooks, research articles, and educational applications that support students' learning outside the classroom. Consequently, completely prohibiting smartphone use during lectures may not represent the most effective or realistic strategy.

Instead, educational institutions may benefit from implementing structured guidelines that promote responsible and purposeful smartphone use. Integrating mobile-assisted learning activities, such as interactive quizzes, digital case discussions, and real-time polling systems, may help redirect smartphone use toward productive academic engagement rather than non-academic distractions (26).

The findings of this study contribute to the growing body of literature examining digital distraction in higher education, particularly within the context of nursing education in developing countries. By providing empirical evidence from nursing institutes in Mirpurkhas, Pakistan, this research offers important insights into smartphone use patterns in smaller educational settings where such data remain limited. However, several limitations should be considered when interpreting the results.

The reliance on self-reported data may introduce response bias, as students may underreport or overestimate their smartphone use behaviors. Additionally, the cross-sectional design of the study limits the ability to establish causal relationships between smartphone use and classroom distraction. Future research employing longitudinal or experimental study designs may provide deeper insights into the long-term impact of smartphone use on

academic performance, learning outcomes, and clinical competency among nursing students (27).

CONCLUSION

This study identified a high prevalence of smartphone use during classroom sessions among undergraduate nursing students in Mirpurkhas, Pakistan, and demonstrated a statistically significant association between the frequency of smartphone use and levels of classroom distraction. Although the relationship observed was relatively weak, the findings suggest that frequent mobile phone engagement during lectures may contribute to reduced attentional focus and learning engagement among nursing students. Given the cognitive demands of nursing education, where sustained attention is essential for understanding complex theoretical and clinical concepts, excessive smartphone use may negatively influence students' academic experience and learning outcomes. At the same time, smartphones remain valuable tools for accessing educational resources and supporting technology-enhanced learning. Therefore, nursing institutions should consider implementing balanced strategies that promote responsible smartphone use while minimizing non-academic distractions in classroom environments. Developing structured institutional policies, increasing awareness regarding digital distraction, and integrating mobile-assisted learning approaches may help enhance student engagement and improve the overall effectiveness of nursing education.

RECOMMENDATIONS

Educational institutions should develop structured policies regulating smartphone use during lectures. Awareness programs promoting responsible smartphone use may help reduce classroom distractions while maintaining the educational benefits of digital technology.

IMPLICATIONS

The findings highlight the importance of balanced smartphone policies in nursing education. Managing digital distractions may help improve students' concentration, engagement, and learning outcomes in classroom settings.

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DECLARATIONS

Ethical Approval

Ethical approval for this study was obtained from the Ethical Review Committee of the College of Nursing Female, Mirpurkhas (Approval No. 26/ERC/03).

Informed Consent

Written informed consent was obtained from all participants prior to data collection.

Conflict of Interest

The authors declare no conflict of interest.

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Authors' Contributions

Concept: LDM, AK; Design: LDM, AK; Data Collection: NC, SJ; Analysis: AK, UM; Drafting: UM

Data Availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Acknowledgments

Not applicable.

Study Registration

Not applicable.