

Smartphone Usage and its Health Hazards among Nursing Students in Selected Institutions of West Bengal: An Online Survey

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Abstract: ***Background:** Smartphones are extensively used among young adults for communication, education, and entertainment. However, excessive use has been associated with physical discomfort, psychological distress, and behavioural dependence. **Objective:** To assess smartphone usage patterns and examine their association with physical health problems and addictive behaviours among nursing students. **Methods:** A quantitative cross-sectional online survey was conducted among 363 nursing students from selected institutions in West Bengal. A structured questionnaire assessed demographic variables, smartphone usage patterns, health-related symptoms, and addiction behaviours. Data were analysed using descriptive statistics, Pearson's correlation, independent t-test, and one-way ANOVA. **Results:** Most participants (73.6%) reported using smartphones for 2-5 hours daily. Mild physical health complaints were reported by 76.9% of students. Addiction-related behaviours were predominantly mild (82.4%). A significant positive correlation was observed between addiction behaviour and physical health problems ($r = 0.330, p < 0.001$). Daily duration of use and frequency of checking were significantly associated with adverse outcomes. **Conclusion:** Smartphone use is highly prevalent among nursing students and is associated with measurable physical discomfort and addictive tendencies. Preventive strategies and awareness programs are recommended.*

Keywords: Smartphone, physical health problems, behavioural problems, nursing students

1. Introduction

Smartphones have become integral to daily living, facilitating communication, internet access, social networking, academic engagement, and entertainment. Their portability and constant connectivity make them indispensable tools, particularly among young adults. However, frequent engagement often results in prolonged screen exposure, habitual checking behaviours, and excessive scrolling, raising concerns about potential adverse physical and psychological consequences.

Globally, smartphone ownership continues to rise, with billions of users worldwide. Young adults constitute one of the highest user groups, especially those in the 16–24-year age category. In India, access to smartphones among students has increased substantially in recent years, particularly in urban and semi-urban settings.

While smartphones serve educational and professional purposes, emerging evidence suggests that excessive use may be associated with sleep disturbances, reduced concentration, musculoskeletal discomfort, anxiety, depressive symptoms, and behavioural dependence. Nursing students, due to academic demands and hostel living conditions, may be particularly vulnerable to problematic usage patterns.

Aim

To assess smartphone usage patterns and their impact on physical and behavioural health among nursing students in selected institutions of West Bengal.

Objectives

- 1) To assess smartphone usage patterns among nursing students.
- 2) To identify reasons for smartphone use.
- 3) To determine the prevalence of physical health problems associated with smartphone use.
- 4) To assess the presence of addiction-related behaviours.

- 5) To examine the association between smartphone usage and demographic variables.
- 6) To correlate smartphone usage with physical health problems.
- 7) To correlate smartphone usage with addiction behaviours.

2. Review of Literature

Wacks and Weinstein (2021) highlighted that excessive smartphone use is associated with depression, anxiety, social withdrawal, poor sleep, and reduced physical activity. Similar findings were reported by Ramos et al. (2024), who noted increased musculoskeletal complaints, especially chronic neck and wrist pain, among students with high smartphone usage. Parajuli et al. (2023) emphasized that older adults with high smartphone usage exhibited higher anxiety and lower cognitive well-being, suggesting that smartphone overuse affects multiple age groups.

Dixe et al. (2020) found that students predominantly used smartphones for social media and gaming rather than educational purposes, aligning with trends observed in India, where only 34% of students used smartphones for study-related tasks (Pallium India, 2023). These studies collectively indicate that both physical and behavioural health risks are associated with prolonged, unregulated smartphone use.

3. Materials and Methods

Study Design: Quantitative cross-sectional survey.

Setting and Population: Nursing students from selected institutions in West Bengal.

Sample Size: 363 participants who voluntarily consented to participate.

Data Collection: A structured online questionnaire via Google Forms, including sections on demographics,

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smartphone usage patterns, reasons for usage, physical health problems, and addiction behaviours.

Ethical Considerations: Permissions were obtained from institutional heads and class coordinators. Participation was voluntary, and confidentiality was ensured.

Variables:

Research variables: smartphone usage, physical health problems, addiction behaviours. Demographic Variables: Age, education level, and accommodation

Statistical Analysis: Descriptive statistics, correlation, ANOVA, and t-tests were used. Significance was set at $p < 0.05$

4. Results

1) Demographic Characteristics

Table 1: Frequency and percentage distribution of demographic variables of the nursing students.

Demographic Variables	Frequency (f)	Percentage (%)
Age in years		
≤20	198	54.6
21 -25	158	43.5
>25	7	1.9
Educational qualification		
GNM 1 st year	58	16.0
GNM 2 nd year	72	19.8
GNM 3 rd year	16	4.4
I & II Sem B.Sc. Nursing	54	14.9
III & IV Sem B.Sc. Nursing	18	5.0
V & VI Sem B.Sc. Nursing	111	30.6
VII Sem B.Sc. Nursing	34	9.4
Accommodation		
Hostel	345	95.0
Home	5	1.4

Among the participants, 54.6% were aged ≤20 years, and the majority (95%) were hostel residents. V & VI Semester B.Sc. Nursing students comprised the largest academic group (30.6%).

2) Smartphone Usage Patterns

Table 2: Frequency and percentage distribution of the nursing students according to the pattern of mobile usage

Pattern of mobile usage	Frequency (f)	Percentage (%)
How many smartphones do you possess?		
>1	13	3.6
1	350	96.4
How many years have you been using smartphones?		
<1 year	54	14.9
1 – 5 years	271	74.7
6 – 10 years	26	7.2
>10 years	12	3.3
How many hours do you use your smartphone per day during week days?		
0 – 1 hours	77	21.2

2 – 5 hours	267	73.6
6 – 10 hours	18	5.0
>10 hours	1	0.3
How often do you check your smartphone in one day?		
0 – 10	193	53.2
11 – 20	122	33.6
21 – 30	33	9.1
>30	15	4.1

Most students (96.4%) owned one smartphone. The majority (74.7%) had been using smartphones for 1–5 years. Daily usage of 2–5 hours on weekdays was reported by 73.6%, and 53.2% checked their smartphones up to 10 times per day.

3) Physical Health Problems

Table 3: Frequency and percentage distribution of the presence of common problems due to the use of smartphones by nursing students, N = 363

Common Problems	Frequency (f)	Percentage (%)
Mild (0 – 12)	279	76.9
Moderate (13-26)	75	20.6
High (27-39)	9	2.5

Table 3 illustrates the frequency and percentage distribution of common problems experienced by nursing students due to smartphone use. The findings reveal that the majority of the students (76.9%) experienced a mild level of problems related to smartphone use. Furthermore, 20.6% students reported a moderate level of problems, while only 9 (2.5%) students experienced a high level of problems. These results indicate that although smartphone-related problems were prevalent among the nursing students, most experienced only mild difficulties, whereas a relatively small proportion reported moderate to high levels of problems associated with smartphone use.

4) Addiction Behaviour

Table 4: Frequency and percentage distribution of the presence of addiction behaviour due to the use of smartphones by the nursing students, N = 363

Addiction Behaviour	Frequency	Percentage
Mild (0-13)	299	82.4
Moderate (14-26)	58	16
High (27-39)	6	1.6

Table 4 depicts the frequency and percentage distribution of addiction behaviour due to smartphone use among nursing students. The findings reveal that the majority of the students, (82.4%), exhibited a mild level of smartphone addiction behaviour. Additionally, 16.0% of the students demonstrated a moderate level of addiction behaviour, while only 1.6% students were found to have a high level of smartphone addiction behaviour. These findings indicate that although smartphone addiction behaviour was present among the nursing students, most of them exhibited only mild addiction behaviour, with a relatively small proportion experiencing moderate to high levels of smartphone addiction.

5) Correlation Analysis

Table 5: Correlation between addiction behaviour and common problems due to the usage of smartphones by nursing students, N = 363

Variables	Mean	S.D	Karl Pearson's Correlation "r" value
Addiction behaviour	13.42	11.56	r=0.330 p=0.0001, S***
Common problems	14.02	12.79	

***p<0.001, S – Significant

Table 5 depicts the correlation between addiction behaviour and common problems associated with smartphone usage among nursing students. The mean score for addiction behaviour was 13.42 ± 11.56, while the mean score for common problems was 14.02 ± 12.79. Karl Pearson's

correlation coefficient revealed a positive correlation between addiction behaviour and common problems (r = 0.330), which was found to be highly statistically significant (p = 0.0001, p < 0.001).

This finding indicates that as the level of smartphone addiction behaviour increases, the occurrence of common problems related to smartphone use also tends to increase among nursing students. Although the correlation is moderate in strength, it suggests a meaningful relationship between smartphone addiction and the development of associated physical, psychological, and social problems. Therefore, excessive smartphone use may contribute to a greater burden of smartphone-related problems among nursing students.

6) Association with Demographic Variables

Table 6: Association of common problems due to the usage of smartphones with selected demographic variables of nursing students, N = 363

Demographic Variables	Frequency	Mean±S.D	One-Way ANOVA / Student Independent "t" test & p-value
Age in years			F=0.496 P=0609 N.S
≤20	198	13.43±13.41	
21 -25	158	14.78±12.02	
>25	7	13.42±12.42	
Educational qualification			F=5.208 P=0.0001 S***
GNM 1 st year	58	15.81±13.88	
GNM 2 nd year	72	7.45±10.86	
GNM 3 rd year	16	19.43±19.35	
I & II Sem B.Sc. Nursing	54	16.98±14.75	
III & IV Sem B.Sc. Nursing	18	10.22±11.14	
V & VI Sem B.Sc. Nursing	111	15.04±9.59	
VII Sem B.Sc. Nursing	34	16.29±9.59	
How many years have you been using smartphones?			F=1.251 P=0.291 N.S
<1 year	54	12.85±14.52	
1 – 5 years	271	14.46±12.53	
6 – 10 years	26	14.76±12.93	
>10 years	12	7.75±8.71	
How many hours do you use your smartphone per day during weekdays?			F=9.824 P=0.0001 S***
0 – 1 hours	77	8.42±9.16	
2 – 5 hours	267	15.09±13.05	
6 – 10 hours	18	20.22±13.37	
>10 hours	1	47.00±	
How frequently do you check your smartphone in one day?			F=14.555 P=0.0001 S***
0 – 10	193	23.92±13.48	
11 – 20	122	10.54±10.99	
21 – 30	33	21.90±14.98	
>30	15	16.17±12.82	

***p<0.001, S – Significant

N.S – Not Significant, p>0.05

The data presented in Table 6 showed the association between the common problems associated with smartphone usage and the socio-demographic variables of nursing students (age, educational status, number of years of using the smartphone, number of hours used per day during weekdays and frequency of checking the smartphone in one day)

The data depicted in Table 8 showed that the common problems associated with smartphone usage were statistically

significant with the value for socio-demographic variables i.e age, educational status, number of hours used per day during weekdays and frequency of checking the smartphone in one day, and only the number of years of using the smartphone is not statistically significant. Educational qualification, daily duration of smartphone use and frequency of checking were significantly associated with both health complaints and addiction behaviour. No significant association was observed with age or total years of smartphone use.

Table 7: Association of addiction behaviour among nursing students with their selected demographic variables.

N = 363

Demographic Variables	Frequency	Mean±S.D	One-Way ANOVA / Student Independent "t" test & p-value
Age in years			F=0.832 P=0.436 N.S
≤20	198	13.11±12.86	
21 -25	158	14.02±9.86	
>25	7	8.85±6.79	
Educational qualification			F=5.244 P=0.0001 S***
GNM 1 st year	58	15.56±15.39	
GNM 2 nd year	72	8.45±8.91	
GNM 3 rd year	16	8.18±9.71	
I & II Sem B.Sc. Nursing	54	14.88±11.37	
III & IV Sem B.Sc. Nursing	18	12.94±15.16	
V & VI Sem B.Sc. Nursing	111	13.74±9.12	
VII Sem B.Sc. Nursing	34	19.64±10.97	
How many years have you been using smartphones?			F=0.388 P=0.761 N.S
<1 year	54	13.12±15.35	
1 – 5 years	271	13.25±10.33	
6 – 10 years	26	15.76±11.49	
>10 years	12	13.66±18.00	
How many hours do you use your smartphone per day during weekdays?			F=9.252 P=0.0001 S***
0 – 1 hours	77	9.02±9.68	
2 – 5 hours	267	13.98±11.50	
6 – 10 hours	18	23.38±12.35	
>10 hours	1	24.00±	
How frequently do you check your smartphone in one day?			F=12.786 P=0.0001 S***
0 – 10	193	11.05±10.90	
11 – 20	122	14.09±10.91	
21 – 30	33	18.93±10.65	
>30	15	26.40±14.26	

***p<0.001, *p<0.05. S – Significant

N.S – Not Significant, p>0.05

The data presented in Table 7 showed the association between the addiction behaviour associated with smartphone usage and the socio-demographic variables of nursing students (age, educational status, number of years of using the smartphone, number of hours used per day during weekdays and frequency of checking the smartphone in one day)

The data presented in Table 9 indicate that smartphone addiction behaviour was found to be statistically significant ($p < 0.01$) in relation to selected socio-demographic variables, namely educational status, number of hours of smartphone use per day during weekdays, and frequency of smartphone checking in a day. This finding suggests that these variables may have a significant influence on the level of smartphone addiction among the study participants.

5. Discussion

The present study examined smartphone usage patterns and their association with physical health problems among nursing students, revealing a statistically significant positive relationship between addiction-related behaviour and physical discomfort. The findings contribute to the growing body of evidence that excessive smartphone usage represents not merely a behavioural trend but a multidimensional health concern affecting young adults, particularly those in health professional programs.

The majority of participants reported daily smartphone use of 2–5 hours, consistent with previous findings among university students globally (1,2). Alhazmi et al. (1) reported

that more than 70% of health science students used smartphones for more than three hours daily, while Chen et al. (2) identified prolonged screen exposure as a significant predictor of neck and shoulder pain. The similarity in usage duration suggests that elevated screen time has become normative among students, thereby increasing cumulative biomechanical strain.

However, unlike Ibrahim et al. (3), who reported a higher prevalence of moderate-to-severe musculoskeletal symptoms, the present study found that most students experienced mild physical health problems. This discrepancy may reflect contextual differences such as ergonomic awareness, lifestyle behaviours, institutional policies, or cultural attitudes toward digital use. It may also indicate early-stage symptom development within this population, emphasizing the importance of early preventive interventions.

A key finding of this study was the moderate positive correlation ($r = 0.330$, $p < 0.001$) between addiction-related behaviour and physical health problems. This aligns with research by Kim and Lee (4), who demonstrated that smartphone addiction significantly predicted musculoskeletal pain and sleep disturbances. Similarly, Samaha and Hawi (5) reported that problematic smartphone uses adversely affected both psychological well-being and academic performance. The present findings extend this literature by specifically quantifying the relationship within a nursing student population and demonstrating that behavioural dependency contributes not only to psychological distress but also to physical morbidity.

From a theoretical perspective, these findings can be interpreted through the framework of behavioural addiction theory, which conceptualizes excessive smartphone use as a maladaptive coping mechanism reinforced by instant gratification and social validation (6). Repetitive engagement with smartphones may result in sustained postural deviations, repetitive strain injuries, and reduced physical activity, thereby establishing a pathway from behavioural compulsion to physiological consequences.

Importantly, while much of the existing literature has focused predominantly on psychological outcomes such as anxiety, depression, and stress (5,6), the present study strengthens the discourse on somatic implications. Given that nursing students are future healthcare providers, persistent physical discomfort may affect clinical efficiency, concentration, and patient safety.

Overall, the findings corroborate existing evidence that excessive and addictive smartphone usage significantly impacts student health. However, the predominance of mild symptoms in the present sample suggests a critical window for preventive strategies before progression to chronic musculoskeletal conditions. Institutional-level digital health education, ergonomic training, and behavioural regulation programs are therefore strongly warranted.

6. Implications

Implications for Nursing Education

The findings of the present study highlight the need to integrate digital wellness education into the nursing curriculum. Given the extensive use of smartphones by nursing students for both academic and personal purposes, it is essential to incorporate structured educational sessions on healthy digital practices, ergonomic posture, screen-time management, and the prevention of musculoskeletal disorders into student orientation programs and professional development activities. Such initiatives may help promote healthier technology use and reduce the risk of smartphone-related health problems.

Faculty members can encourage responsible smartphone use during academic hours and promote evidence-based mobile applications that support learning rather than distraction. Establishing guidelines for balanced digital engagement may help reduce excessive non-academic usage.

Implications for Nursing Practice

As future healthcare professionals, nursing students are expected to model healthy lifestyle behaviours. Awareness regarding the adverse health effects of prolonged smartphone use is essential not only for their personal well-being but also for patient education.

Nurses play a critical role in community health promotion. Understanding smartphone-related health hazards will enable them to:

- Educate adolescents about digital hygiene
- Promote ergonomic practices
- Identify early signs of digital addiction
- Provide counselling regarding screen-time moderation

Thus, incorporating digital health awareness into nursing training strengthens preventive healthcare delivery.

Implications for Nursing Administration

Institutional administrators may develop policies promoting healthy digital environments within campuses and hostels. Recommendations include:

- Scheduled digital detox hours
- Ergonomic awareness campaigns
- Posters on posture correction
- Workshops on time management and stress coping

Monitoring excessive smartphone dependency among students may help prevent long-term physical and psychological consequences.

Implications for Research

The present study provides baseline data from West Bengal; however, further research is warranted. Future studies may:

- Use longitudinal designs to assess causal relationships
- Employ objective screen-time tracking applications
- Explore psychological variables such as stress, anxiety, and self-esteem
- Compare rural and urban student populations

Interventional studies evaluating digital hygiene training programs would also contribute valuable evidence.

7. Conclusion

The present study highlights that smartphone usage is highly prevalent among nursing students in West Bengal, with the majority engaging in daily use for social media, communication, gaming, and educational purposes. While smartphones offer significant academic and social benefits, the findings reveal a concerning proportion of students experiencing physical health problems such as musculoskeletal pain, eye strain, sleep disturbances, and psychosocial impacts, including mild to moderate addiction behaviours.

The study further demonstrates that specific patterns of smartphone use- namely communication, social media engagement, educational searching, and offline gaming- significantly predict the occurrence of physical health problems. Additionally, addiction behaviours were positively correlated with physical health problems, suggesting that behavioural dependence exacerbates the negative impact on student well-being.

Given the rigorous academic and clinical demands on nursing students, unregulated smartphone usage could potentially interfere with learning outcomes, professional performance, and overall health. Therefore, targeted interventions such as structured awareness programs, ergonomic guidance, digital literacy workshops, and institutional policies to promote balanced smartphone use are warranted.

In conclusion, this study underscores the critical need for a proactive approach to mitigate smartphone-related health risks among nursing students. It provides evidence-based insights for educators, administrators, and policymakers to develop strategies that foster responsible smartphone usage

while preserving the academic and social benefits of technology.

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