Chattagram Maa-O-Shishu Hospital Medical College Journal
Volume 25, Issue 1, January 2026
https://doi.org/10.3329/cmoshmcj.v25i1. 89895

Original Article

The Digital Impact: Investigating Smartphone Addiction in Medical Students

Sabrina Karim[1*]
Happy Rani Barua[2]

[1]Department of Forensic Medicine and Toxicology
Southern Medical College
Chattogram, Bangladesh.

[2]Department of Forensic Medicine and Toxicology
Chattagram Maa-O-Shishu Hospital Medical College
Chattogram, Bangladesh.

Abstract

Background: *Smartphone use has grown rapidly worldwide, bringing both benefits and significant negative impacts such as impaired sleep, reduced attention, academic decline and strained relationships, particularly among youth. This study aims at investigating sociodemographic and behavioral predictors of smartphone addiction among young medical students to inform prevention and intervention strategies.*

Materials and methods: *This cross-sectional study surveyed 500 medical students from five colleges in Chattogram using a structured questionnaire covering sociodemographics, smartphone use patterns, the Smartphone Addiction Scale–Short Version (SAS-SV) Smartphone addiction was defined using SAS-SV cutoffs of ≥31 for males and ≥33 for females, with higher scores indicating greater risk. Data were analyzed in SPSS 26 using descriptive statistics, Chi-square tests, correlations, Mann–Whitney U tests and binary logistic regression, with $p < 0.05$ were considered significant.*

Results: *Sex was significantly associated with smartphone use duration ($\chi^2 = 23.039$, $p = 0.003$), as was residence area ($\chi^2 = 22.502$, $p < 0.001$), while income showed a modest association ($\chi^2 = 12.775$, $p = 0.047$). Logistic regression showed strong predictors of addiction, including >5 h/day use (OR = 6.61, $p < 0.001$), gaming (OR = 2.20, $p = 0.043$) social media use (OR = 2.41, $p = 0.002$) and night-time use (OR = 2.49, $p < 0.001$) with academic use being protective (OR = 0.54, $p = 0.017$). Using sex-specific SAS cut-offs (>31 for males, >33 for females) 78.8% of males and 44.4% of females were addicted ($\chi^2 = 140.838$, $p < 0.001$, $\varphi = 0.531$).*

Conclusion: *Smartphone addiction was highly prevalent among medical students, with longer daily use, gaming, social media, night-time use, and frequent phone checking increasing addiction risk, while academic use was protective. Sex-specific differences showed more males exceeding addiction cutoffs despite higher median scores in females, highlighting the need for targeted interventions.*

Key words: Behavioral patterns; Medical students; Smartphone addiction; Smartphone use; Sociodemographic factors.

INTRODUCTION

Mobile phones, first introduced by Motorola in 1973 and commercially launched in 1984, have become essential communication tools. Global mobile subscriptions surpassed seven billion by 2016, while internet usage rose from 6.5% in 2000 to 43% in 2015, with household access increasing from 18% to 46% between 2005 and 2015.[1,2] Research increasingly shows that excessive smartphone use can disrupt sleep, impair attention and concentration, increase academic procrastination, strain relationships, and lower academic performance, especially among young people and students.[3,4,5,6]

*Correspondence to:
Dr. Sabrina Karim
Assistant Professor
Department of Forensic Medicine & Toxicology
Southern Medical College
Chattogram, Bangladesh.
Mobile : +88 01713 23 11 38
Email : sbrn_krm@yahoo.com.au

Date of Submission : 25.08.2025
Date of Acceptance : 07.10.2025

www.banglajol.info/index.php/CMOSHMCJ

Problematic smartphone use is considered a behavioral addiction, resembling non-substance addictions like gambling, characterized by loss of control, tolerance, withdrawal, compulsive use, and negative daily impacts, though it is not yet recognized in the DSM or ICD.[7,8,9] Mobile Phone Addiction (MPA) can reduce attention, concentration and face-to-face interactions, lower self-esteem through social comparison, increase impulsivity and risky behaviors and heighten loneliness and social isolation.[10,11]

Previous research has shown that Smartphone Addiction (SA) is linked to sociodemographic factors, with younger individuals being more susceptible to SA. For instance, a recent study conducted in Saudi Arabia identified youth as a significant predictor of smartphone addiction.[12,13,14,15] Problematic smartphone use has become an increasing concern and a significant public health issue globally. A meta-analysis examining 81 studies across 24 countries reported the highest prevalence of problematic smartphone use in China and Saudi Arabia, while the lowest rates were identified in Germany and France.[16,17]

The purpose of this research was to investigate the sociodemographic factors and behavioral patterns associated with smartphone addiction among young adults. Ultimately, the goal is to inform the development of effective prevention and intervention strategies to address problematic smartphone use and its negative consequences on mental health and daily functioning.

MATERIALS AND METHODS

A cross-sectional study was conducted among 500 medical students from five medical colleges: Southern Medical College, Chittagong Medical College, Chattagram Maa-O-Shishu Hospital Medical College, Chattagram International Medical College and Marine City Medical College from January to July 2025. The sample size of 500 was determined using a single proportion formula, assuming a 50% prevalence of smartphone addiction (As no prior local data were available) with a 95% confidence level and a 5% margin of error. To accommodate potential non-response, an additional 10% was added, resulting in a final target of 500 participants.

The ethical clearance for the study was taken from the Institutional Review Board (IRB) prior the commencement of this research.

Inclusion criteria

- Medical students enrolled in the 1st to 5th years at Southern Medical College.
- Students who voluntarily consent to participate in the study.
- Students who were willing to provide accurate sociodemographic information.

Exclusion criteria

- Medical students not enrolled in the undergraduate program.
- Students who refused to participate or provide incomplete data.
- Students who did not provide informed consent.

A convenience sampling technique was used to recruit participants from the selected colleges. Eligible participants were undergraduate medical students who provided informed consent and were present during the data collection period. Data were collected using a pretested, structured questionnaire comprising four sections: the first section captured sociodemographic characteristics, the second section focused on smartphone-related questions (Including usage patterns and purposes) the third section contained the Smartphone Addiction Scale (SAS). SAS were measured using a Likert scale format. The questionnaire was self-administered after obtaining informed written consent from each participant.

To assess smartphone addiction, the study utilized the shortened version of the Smartphone Addiction Scale (SAS-SV) originally developed by Kwon in 2013.[18] The SAS-SV is a concise form of the full Smartphone Addiction Scale and consists of 10 self-reported items measured on a 6-point Likert scale, ranging from 1 (Strongly disagree) to 6 (Strongly agree). Participants' total scores range from 10 to 60, with higher scores indicating a greater risk of smartphone addiction. The Persian version of the SAS-SV has been previously validated and demonstrated reliability in earlier studies. Following the developers' guidelines, a cutoff score of ≥31 for males and ≥33 for females was used to identify potential smartphone addiction among participants.

Data analysis was conducted using SPSS version 26. Descriptive statistics summarized participant characteristics, while inferential analyses explored associations and predictors of smartphone use and addiction. The Chi-square (χ^2) test assessed associations between categorical sociodemographic variables (Gender, residence area, living arrangement, monthly income) and duration of smartphone use. Pearson's and Spearman's correlation coefficients evaluated the strength and direction of these relationships. Binary logistic regression identified significant predictors of smartphone addiction, estimating Odds Ratios (ORs) with 95% Confidence Intervals (CIs) for variables such as phone ownership, daily usage duration, purpose of use, behavioral patterns, and frequency of phone checking. The Mann–Whitney U test compared addiction scores between males and females. Statistical significance was set at $p < 0.05$.

RESULTS

Among 500 participants, smartphone use duration was significantly associated with sex (More females 1–5 years, $\chi^2 = 23.039$, $p = 0.003$) residence (Rural participants mostly 1–5 years, $\chi^2 = 22.502$, $p < 0.001$) and modestly with family income (Lower-income used 1–5 years, $\chi^2 = 12.775$, $p = 0.047$) while living arrangement showed no significant association shown in table I.

https://doi.org/10.3329/cmoshmcj.v25i1. 89895

Table I Sociodemographic pattern and association with duration of smartphone

Variables	Years of Use						
Total participants= 500	1-5	>5-10	>10-15	Chi-square	p Value	Pearson R	Spearman Correlation
i) Gender							
● Male (198)	71	102	25	23.039	0.003	0.136	0.136
● Female (302)	164	111	27				
ii) Residence area							
● Rural (63)	46	10	7	22.502	0.000	0.145	0.167
● Urban (437)	189	203	45				
iii) Living							
● Alone (22)	10	12	0				
● With family (374)	174	159	41	4.010	0.856	-0.004	-0.010
● Hostel (104)	51	42	11				
iv) Monthly income (In Taka)							
● 10,000-29,999 (93)	48	38	7	12.775	0.047	0.099	0.109
● 30,000-49,999 (225)	116	88	21				
● 50,000-99,999 (114)	45	50	19				
● >1 lac (68)	26	37	5				

Logistic regression identified key predictors of smartphone addiction among 500 participants. Personal smartphone ownership (OR = 4.77, p = 0.026) longer daily use (>5 hours, OR = 6.61, p < 0.001) gaming (OR = 2.20, p = 0.043) social media use (OR = 2.41, p = 0.002) night-time use (OR = 2.49, p < 0.001) and frequent phone checking increased addiction risk, while academic use was protective (OR = 0.54, p = 0.017). Frequency of daily checks showed a dose-response effect, with 5–10 times (OR = 2.06) and >10 times (OR = 3.00) increasing odds shown in Table II.

Table II Binary Logistic Regression predicting Smartphone addiction

Predictor	Frequency n=500 (Percentage)	B (SE)	Wald	OR (95% CI)	p-value
Own a phone (Yes)	464	1.56 (0.70)	4.96	4.77 (1.22–18.71)	0.026*
Duration of use (In hours)					
● <1	35	Reference	-	Baseline (1.00)	-
● 1–3	127	0.88 (0.42)	4.39	2.41 (1.06–5.46)	0.036*
● 3–5	192	1.44 (0.41)	12.35	4.24 (1.91–9.42)	<0.001**
● >5	146	1.89 (0.45)	17.63	6.61 (2.75–15.88)	<0.001**
Purpose of usage:					
● Shopping (Yes)	53	0.58 (0.37)	2.46	1.78 (0.88–3.59)	0.117
● Messaging (Yes)	67	0.67 (0.35)	3.66	1.95 (0.99–3.84)	0.056
● Streaming (Yes)	12	0.91 (0.62)	2.15	2.49 (0.75–8.32)	0.142
● Gaming (Yes)	40	0.79 (0.39)	4.09	2.20 (1.03–4.71)	0.043*
● Social Media (Yes)	239	0.88 (0.28)	9.89	2.41 (1.40–4.15)	0.002**
● Academic Use (Yes)	89	–0.62 (0.26)	5.65	0.54 (0.33–0.90)	0.017*
Use at night (Yes)	344	0.91 (0.27)	11.34	2.49 (1.48–4.21)	<0.001**
Check after waking up (Yes)	323	0.76 (0.28)	7.34	2.13 (1.23–3.68)	0.007**
Use before sleep (Yes)	371	0.67 (0.25)	7.18	1.95 (1.21–3.13)	0.007**
Use in toilet (Yes)	131	0.39 (0.24)	2.62	1.47 (0.93–2.34)	0.105
Phone checks: times/day					
● <5	190	Reference	-	1.00 (Baseline)	-
● 5–10	172	0.72 (0.31)	5.39	2.06 (1.13–3.75)	0.020*
● >10	138	1.10 (0.33)	10.94	3.00 (1.57–5.72)	0.001**

Note: B (SE): regression coefficient (Standard error) Wald: Wald chi square test, OR (95% CI): Odds Ratio (95% Confidence Interval).

Likert-scale responses from 500 participants indicated widespread problematic smartphone use. Over half reported behaviors such as disrupted sleep (58.8%) poor concentration (58%) checking phones without notifications (60%) failed attempts to reduce use (59.8%) emotional dependence (59.8%) and missing planned work or receiving complaints (41.8%) highlighting clear addiction patterns shown in table III.

Table III Likert-Scale Distribution of Smartphone Addiction Scale (SAS Scale)

Questions	1	2	3	4	5
i) I miss planned work due to smartphone use	92	90	97	121	100
ii) I have a hard time concentrating while studying because of my smartphone	34	84	92	175	115
iii) I feel impatient when I don't have access to my phone	51	73	124	141	111
iv) I use my smartphone even when I know it affects my sleep	47	76	107	167	103
v) I get restless when I cannot use my smartphone	61	108	118	121	92
vi) I check my smartphone even with no notifications	54	73	91	174	108
vii) My family/friends complain about my smartphone usage	73	105	113	115	94
viii) I try to reduce smartphone use but fail	40	90	100	166	104
ix) I feel more connected to people online than in real life	116	92	107	95	90
x) I use my phone to escape from stress or negative feelings	58	58	85	165	134

The Smartphone Addiction Scale (SAS) scores of 500 participants were categorized into three levels: not addicted (Scores 10–30), borderline risk (31–32) and at risk of smartphone addiction (35–50). More than half of the participants (55.0%) were in the high-risk category, while 38.8% were classified as not addicted and 6.2% fell in the borderline range.

A Mann-Whitney U test was conducted to explore sex differences in addiction scores. The test revealed a statistically significant difference between male and female participants (U = 71, p = 0.003), with females showing higher addiction scores. The effect size was small (r = 0.136), indicating a modest but meaningful difference in smartphone addiction levels based on sex. These findings suggest that female participants are more likely to fall into the higher-risk category of smartphone use compared to their male counterparts displayed in Table IV.

https://doi.org/10.3329/cmoshmcj.v25i1. 89895 Volume 25, Issue 1, January 2026

Table IV Smartphone Addiction Scale Score Distribution and Sex Differences Analyzed by Mann-Whitney U Test

Smartphone Addiction Scale	Frequency (n)= 500	Percentage (%)		Mann-Whitney U Test (by Sex)
Score Range			Groups	Male (n=198)
				Female (n=302)
10 – 30 (Not addicted)	194	38.8	U statistic	71
31 – 32 (Borderline risk)	31	6.2	Chi-square	
			(Approx.)	23.039
33 – 50 (Risk of smartphone use)	275	55.0	p-value	0.003
Total	500	100	Effect size (r)	0.136
			Interpretation	Significant difference, females have higher addiction scores (Small effect size)

Note: U statistic: Mann-Whitney U test statistic, Chi-square (Approx.): Chi-square approximation of the Mann-Whitney test, p-value: Probability value indicating statistical significance, Effect size (r): Measure of the magnitude of difference between groups.

When males show SAS score >31 and females >33 they are considered Smart Phone addicted.[18] A statistically significant association was observed between sex and smartphone addiction status (χ^2 = 140.838, p< 0.001). The proportion of addicted males (78.79%) was markedly higher than that of addicted females (44.37%). The Phi coefficient (φ= 0.531) indicated a strong positive association, suggesting that being male was strongly related to a higher likelihood of exceeding the smartphone addiction cut-off score displayed in Table V.

Table V Association between Sex and Smartphone Addiction Status with Chi-square and Phi Coefficient Analysis

Gender	Addicted n (%)	Not Addicted n (%)	Total n (%)	χ^2 (p-value)	Phi Coefficient
Male (SAS >31)	156 (78.79%)	42 (21.21%)	198 (39.6%)	140.838	0.531
Female SAS (>32)	134 (44.37%)	168 (55.63%)	302 (60.4%)	(<0.001)***	
Total	290 (58.0%)	210 (42.0%)	500 (100%)		

DISCUSSION

This study examined smartphone addiction among 500 participants, finding that females and rural residents reported shorter use (1–5 years) while urban and higher-income individuals had longer usage histories. S. anna et al found in her research that, the median daily phone usage was 152.2 ± 0.5 minutes for rural participants and 174.9 ± 0.2 minutes for urban participants.[19]

While living arrangement was not significantly related to smartphone use duration, monthly family income showed a modest association, suggesting that socioeconomic factors may influence access to and patterns of smartphone use. Higher-income families, particularly those earning above Tk. 50,000, buy smartphones more frequently, indicating a strong link between income level and purchasing frequency.[20]

Logistic regression showed that owning a personal smartphone and using it over five hours daily significantly increased addiction risk, with over six times higher odds than low-use users. In a research in Assam, Students using smartphones for 3-4 hours/day and more than 5 hours/day are 3.2 and 5.7 times more likely to be addicted, while those using their phones 21-50 times/day and over 50 times/day are 6.7 and 10.9 times more likely to be addicted compared to light users, indicating a strong dose-response relationship between usage and addiction risk.[21] Gaming and social media were significant addiction predictors, while academic use was protective, reducing the risk of problematic smartphone use. High levels of smartphone use by adolescents in India because of social networking and gaming lead to smartphone addiction.[22]

Nighttime use, checking phones after waking or before sleep, and frequent checking were strongly linked to addiction, highlighting compulsive behaviors and related sleep and concentration issues.In a study in UK, the findings indicate that smartphone addiction is significantly associated with poor sleep quality, as evidenced by 68.7% of addicted participants reporting poor sleep compared to 57.1% of non-addicted peers, with an adjusted odds ratio of 1.41, suggesting that smartphone addiction increases the likelihood of poor sleep by 41%.[23]

Gender differences were evident: females had higher median scores, but more males exceeded addiction cut-offs (φ= 0.531), reflecting differences in usage patterns and behaviors. Using the Smartphone Application-Based Addiction Scale (SABAS) cutoff score of 23, 29.0% of participants were classified as at risk for smartphone addiction, with no significant difference by exercise status but a significantly higher risk among females than males (31.7% vs 20.8%, p = 0.006).[24]

LIMITATIONS

This study has several limitations. First, data were collected via self-reported questionnaires, which may be subject to recall bias or social desirability bias. Second, convenience sampling from five medical colleges in Chattogram limits the generalizability of findings to other populations or regions. Finally, factors such as personality traits, academic workload or mental health history were not assessed, which could influence smartphone addiction risk.

CONCLUSION

Smartphone addiction was highly prevalent among medical students, with significant associations observed between addiction risk and sociodemographic as well as behavioral factors. Longer daily use, gaming, social media engagement, night-time use and frequent phone checking markedly increased addiction odds, while academic use was protective. Sex-specific analyses revealed a higher proportion of males exceeding addiction cutoffs despite females showing higher median scores, underscoring the need for targeted awareness and intervention strategies in this population.

RECOMMENDATION

Targeted interventions are needed to reduce smartphone addiction among medical students, focusing on promoting healthy usage habits, limiting night-time use and managing frequent phone checking. Educational programs should encourage purposeful, academic-oriented smartphone use and raise awareness about the behavioral and psychological risks of excessive use. Future research should adopt longitudinal designs to explore causal relationships and assess the effectiveness of intervention strategies.

ACKNOWLEDGEMENT

We would like to express our heartfelt gratitude to all the institutes and participants who contributed to this study, as well as the administrators and staff of Southern Medical College, Chattogram.

DISCLOSURE

All the authors declared no competing interest.

REFERENCES

1. Meet Marty Cooper-the inventor of the mobile phone. BBC News. http://www.news.bbc.co.uk/2/hi/programmes/click_online/8639590.stm. 2010.
2. International Telecommunication Union (ITU). ICT facts and figures – the world in 2015. https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures 2015.pdf.
3. Brunborg GS, Mentzoni RA, Molde H et al. The relationship between media use in the bedroom, sleep habits and symptoms of insomnia. J Sleep Res. 2011;20(4):569-575. doi:10.1111/j.1365-2869.2011.00913.x.
4. Yang Z, Asbury K, Griffiths MD. An exploration of problematic smartphone use among Chinese university students: Associations with academic anxiety, academic procrastination, self-regulation and subjective well-being. Int J Ment Health Addict. 2018:1-19. doi:10.1007/s11469-018-9961-1
5. Marty-Dugas J, Ralph BC, Oakman JM, Smilek D. The relation between smartphone use and everyday inattention. Psychol Conscious (Wash D C). 2018;5(1):46-60. doi:10.1037/cns0000131.
6. Im IC, Jang K. The convergence influence of excessive smartphone use on attention deficit, learning environment, and academic procrastination in health college students. J Korea Converg Soc. 2017;8(12):129-137.
7. Yu S, Sussman S. Does smartphone addiction fall on a continuum of addictive behaviors? Int J Environ Res Public Health. 2020;17(2):422. doi:10.3390/ijerph17020422
8. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, DC: American Psychiatric Association. 2013.
9. World Health Organization. International classification of diseases 11th revision (ICD-11). https://icd.who.int/en.
10. Sarkar TK, Taneja N, Jana PK et al. Effect of mobile phone overuse on health of medical students. Int J Med Sci Public Health. 2018;8(1):91-94.
11. Wacks Y, Weinstein AM. Excessive smartphone use is associated with health problems in adolescents and young adults. Front Psychiatry. 2021;12:669042. doi:10.3389/fpsyt.2021.669042
12. Aljomaa SS, Al Qudah MF, Albursan IS, Bakhiet SF, Abduljabbar AS. Smartphone addiction among university students in the light of some variables. Comput Hum Behav. 2016;61:155-164. doi:10.1016/j.chb.2016.03.041.
13. Augner C, Hacker GW. Associations between problematic mobile phone use and psychological parameters in young adults. Int J Public Health. 2012;57(3):437-441. doi:10.1007/s00038-011-0234-z.
14. Rozgonjuk D, Kattago M, Täht K. Social media use in lectures mediates the relationship between procrastination and problematic smartphone use. Comput Hum Behav. 2018;89:191-198.
15. Alhassan AA, Alqadhib EM, Taha NW, Alahmari RA, Salam M, Almutairi AF. The relationship between addiction to smartphone usage and depression among adults: A cross-sectional study. BMC Psychiatry. 2018;18:148. doi:10.1186/s12888-018-1745-4
16. Ding D, Li J. Smartphone overuse: A growing public health issue. J Psychol Psychother. 2017;7(1):1-3.
17. Paterna A et al. Problematic smartphone use and academic achievement: A systematic review and meta-analysis. J Behav Addict. 2024;13(2):313-326.

REFERENCES

18. Kwon M, Kim DJ, Cho H, Yang S. The smartphone addiction scale: Development and validation of a short version for adolescents. PLoS One. 2013;8(12):e83558. doi:10.1371/journal.pone.0083558.

19. Sapienza A, Lítlá M, Lehmann S, Alessandretti L. Exposure to urban and rural contexts shapes smartphone usage behavior. PNAS Nexus. 2023;2(11):pgad357. doi:10.1093/pnasnexus/pgad357.

20. Gagan, Arya A. Influence of family's income on the buying behavior of smartphones in Haryana. Int J Creative Res Thoughts. 2023;11(3):567-569.

21. Phukan I, Chetia A, Mahanta B. Smartphone addiction and associated risk factors amongst undergraduate medical students in a medical college of Assam: A cross-sectional study. Int J Community Med Public Health. 2022;9(5). doi:10.18203/2394-6040.ijcmph20221027.

22. Sadgun SH. Assessing the impact of smartphone addiction on internet gaming disorder in adolescents. Int J Indian Psychol. 2024;12(3):1473-1482. doi:10.25215/1203.144.

23. Sohn SY, Krasnoff L, Rees P, Kalk NJ, Carter B. The association between smartphone addiction and sleep: A UK cross-sectional study of young adults. Front Psychiatry. 2021;12:629407. doi:10.3389/fpsyt.2021.629407.

24. Pirwani N, Somogyi A, Szabo A. Do regular exercise, gender and age influence smartphone addiction? Analyzing screen time and smartphone deprivation symptoms. Front Psychol. 2025;16:1586762. doi:10.3389/fpsyg.2025.1586762.