SCREEN TIME CRISIS: ASSESSING MOBILE PHONE DEPENDENCE AMONG FUTURE PHARMACISTS AND ITS PUBLIC HEALTH IMPLICATIONS

Pankaj G. Jain*[1], Sughosh V. Upasani[2], Dikshita B. Patil[3], Nilesha S. Jain[4], Govinda S. Bhandari[5], Sunaina S. Manure[6], Uday L. Bachhav[7], Jitendra D. Bhavsar[8]

[1]Department of Pharmacology, [2]Department of Pharmacy Practice, SES's R. C. Patel Institute of Pharmaceutical Education and Research, Shirpur, 425405, Dhule, Maharashtra, India.
[3]School of Pharmacy, Pimpri Chinchwad University, Mohitewadi, 412106, Pune, Maharashtra, India.
[4]Senior Lecturer, DCS Institute of Pharmacy, Deopur, Dhule, 424002, Maharashtra, India.
[5]Department of Pharmaceutics, SES's R. C. Patel Institute of Pharmaceutical Education and Research, Shirpur, 425405, Dhule, Maharashtra, India.
[6]Department of Pharmacognosy, [7]Department of Pharmaceutical Quality Assurance, KVPSS Institute of Pharmaceutical Education, Boradi, Shirpur, Maharashtra 425428
[8]Principal, Arogya Sampada College of Pharmacy, Bhoras, 424101, Chalisgaon, Jalgaon, Maharashtra, India.
Corresponding Author: Dr. Pankaj G. Jain*
SES's R. C. Patel Institute of Pharmaceutical Education and Research, Shirpur, 425405, Dhule, Maharashtra, India.

ABSTRACT
Introduction: Mobile phone dependence is a growing public health concern, particularly among young adults, including pharmacy students. As future healthcare professionals, understanding their patterns of mobile phone use and associated health implications is crucial for developing preventive strategies.
Materials and Methods: This cross-sectional study evaluated mobile phone dependence among 376 undergraduate pharmacy students using a validated Mobile Phone Dependence (MPD) Questionnaire based on ICD-10 diagnostic criteria. Demographic data and mobile phone usage patterns were analysed. Statistical associations were assessed using statistical software, employing Chi-Square and Fisher's Exact tests.
Results: The prevalence of MPD was 20.74% among participants, with emotional regulation (68.09%) and impaired control (50.53%) as the most frequently observed diagnostic criteria. Time spent on mobile phones per day showed a significant association with MPD ($p < 0.001$), while no significant relationship was found with gender or duration of phone ownership. Family structure (nuclear and single parent) was marginally significant ($p = 0.0011$).
Discussion: The findings highlight the substantial prevalence of mobile phone dependence among pharmacy students, driven primarily by emotional regulation needs and impaired control. Excessive screen time was a key factor, emphasizing the necessity for targeted interventions. Educational institutions should implement cognitive-behavioural strategies, promote digital detox initiatives, and encourage responsible mobile phone use. Although insightful, this study's limitations include a cross-sectional design and single-institution sampling.
Conclusion: Future longitudinal research with larger, diverse populations is recommended to better understand the long-term impacts of mobile phone dependence and intervention efficacy.

Keywords: Mobile phone dependence, Pharmacy students, Emotional regulation, Impaired control, Screen time, Interventions

Introduction

The World Health Organization (WHO), as outlined in the ICD-10 (International Classification of Diseases, 10th Revision), defines dependence syndrome as a collection of physiological, behavioural, and cognitive characteristics where the use of a substance or class of substances becomes more important to an individual than other activities that previously held greater value.[1,2] However, this definition specifically addresses dependence on chemical substances or drugs. In contrast, mobile phones and the internet fall under non-substance behavioural addictions, reflecting the growing concerns over their excessive use. Internet addiction has been studied extensively, but its psychopathological underpinnings are still up for debate.[3] Mobile phones have become an integral part of modern life, transforming from mere communication devices to powerful tools that offer endless functions and conveniences. In recent years, they have evolved into a necessity due to the wide range of services they provide, such as instant communication, access to information, online learning, social networking, and digital entertainment. For pharmacy students, who predominantly belong to the young adult population, mobile phone dependency is particularly significant because these students will play a critical role in shaping the healthcare system. As of January 2018, approximately 2.53 billion people worldwide owned a smartphone[4] a number that has only continued to grow due to the rapid evolution of technology and the increasing affordability of smartphones. However, along with the benefits, excessive smartphone use has led to the emergence of several health-related issues. Problems like insomnia and sleep apnoea are becoming more common due to prolonged screen exposure.[5] Additionally, difficulty concentrating and maintaining attention is a frequent complaint among heavy users. Beyond mental and behavioural challenges, physical ailments such as Text Neck Syndrome, caused by the prolonged downward head posture while using phones, and Cell Phone Vision Syndrome, characterized by eye strain and vision problems, are increasingly prevalent.[6,7] In response to rising concerns about digital addiction, the WHO has introduced the concept of Gaming Disorder, which primarily affects children and young adults who engage excessively in video gaming.[8] This recognition underscores the need to consider behavioural addictions seriously. The estimated prevalence rates of internet addiction may still be influenced by the vast range of conceptual approaches, even though internet addiction has been a prominent research topic for more than two decades. Internet addiction was first conceptualised by Young in 1996 as a generalised impulse control disease with decreased control

as its basic psychopathology.[9] Several studies suggest that criteria for pathological gambling and substance use disorder were used in the development of self-report measures for assessing internet addiction.[10] Despite extensive study in recent years, the causes and extent of internet addiction remain a mystery. Several studies have examined smartphone usage among medical students in India. A study conducted in Kerala provided insights into usage patterns, while another focused on the general involvement of mobile phones in daily life. Research at Indore Medical College highlighted a specific condition known as Nomophobia, or the fear of being without a mobile phone. Furthermore, investigations among engineering students and resident doctors revealed that approximately 23.4% of residents showed signs of smartphone addiction. International studies further confirm widespread smartphone addiction among medical students, indicating that this issue is not restricted to a single region or country but has become a global public health concern. Several studies across India have estimated the prevalence of dependence syndrome ranges between 18.5% - 52% in medical students and residents. Some reports state the presence of mobile phone addiction- like behaviour in a significant number and nomophobia in school going children and youth.[11,12] Therefore, recognizing the potential harms of excessive mobile phone use and understanding its prevalence among young adults, particularly undergraduate pharmacy students, becomes crucial for developing effective interventions and promoting healthier technology habits. This study seeks to evaluate the extent of Mobile Phone Dependence Syndrome (MPD) among future healthcare professionals and provide insights into preventive measures.

Materials and methods

The study utilized multiple tools and procedures to investigate mobile phone dependence among undergraduate pharmacy (para-medical) students. A Case Record Form was designed to collect general demographic information and specific details about mobile phone usage habits, serving as a foundational record for participant data. The Mobile Phone Dependence (MPD) Questionnaire, a validated 20-item tool developed by Aggarwal et al., assessed mobile phone usage patterns using a binomial (yes/no) response format. This questionnaire helped identify participants meeting the ICD-10 diagnostic criteria for dependence syndrome, encompassing behavioural and psychological symptoms. Additionally, Informed Consent was taken from participants

with proper approvals from authorities. Participants completed the MPD questionnaire, which was collected for analysis. Incomplete responses or refusals to participate led to exclusion from the final analysis. Data from the completed questionnaires were analysed to identify mobile phone dependence using ICD-10 diagnostic criteria. Key domains assessed included intense desire (Q1), impaired control (Q3, Q8, Q11, Q19), withdrawal symptoms (Q10, Q13, Q16), tolerance (Q2), decreased alternative pleasures (Q5, Q6, Q7, Q17), and harmful use (Q12). Participants meeting three or more criteria were classified as having mobile phone dependence syndrome. For statistical analysis, data was entered into Microsoft Excel and processed using suitable software. Descriptive statistics such as mean, standard deviation, frequency, and percentages summarized the findings. Pearson's Chi-Square test was used to determine associations between variables, ensuring a robust and accurate interpretation of the results.

Results

A comprehensive analysis of mobile phone dependence (MPD) was conducted on 376 participants, revealing significant behavioural trends and correlates. **Table 01** outlines the responses to the Mobile Phone Dependence Questionnaire. The highest positive response rate was for using mobile phones to overcome negative moods (68.09%), highlighting a strong association between emotional regulation and mobile phone usage. Additionally, 66.22% reported frequently returning missed calls, and 65.43% felt they were becoming addicted to mobile phone use. A considerable proportion of students (50.53%) had made unsuccessful attempts to control or reduce mobile phone use, indicating impaired control. **Table 02** outlines the prevalence of MPD, defined by meeting three or more diagnostic criteria based on ICD-10, was found to be 20.74% (78 out of 376 participants). Among the diagnostic criteria, the most frequently reported were emotional regulation (intense desire) at 39.36% and impaired control at 37.77%. Tolerance, defined as the need to use the mobile phone for increased amounts of time, was observed in 21.81%. Withdrawal symptoms, such as anxiety when unable to use a mobile phone, were reported by 2.39%, reflecting a lower prevalence of severe dependency symptoms.

Table No 01 – Responses to the mobile phone dependence questionnaire.

Positive response (YES)		Number	%
Q1	When not using the mobile, are you preoccupied with the mobile phone (Keep constantly thinking about the previous and the future uses)?	159	42.29
Q2	Do you need to use mobile phone for increased amounts of time in order to achieve satisfaction/ betterment?	155	41.22
Q3	Have you made unsuccessful efforts to control/ decrease or stop mobile phone use?	190	50.53
Q4	Do you get upset when attempting to cut down mobile phone use?	161	42.82
Q5	Has mobile phone use led to decrease in meeting the friends in person	195	51.86
Q6	Has mobile phone use has made you spend less time with friends/family	210	55.85
Q7	Has mobile phone use has led to decrease in socialization? (meeting friends/ hanging out)	200	53.19
Q8	Do you lose track of time after starting to use mobile phone for SMS, games, music etc?	246	65.43
Q9	Do you lie to others to conceal the extent of your use of mobile phone?	138	36.70
Q10	Do you become anxious of missing something if you have to switch off your mobile phone for any reason?	197	52.39
Q11	Do you compulsively respond to calls/ SMSs at places which don't permit (Class, driving, group participation)?	166	44.15
Q12	Do you compulsively respond to calls/SMSs at places where it is dangerous to do so (crossing road, driving/working at machines)?	122	32.45
Q13	Do you call back to most of the missed calls?	249	66.22
Q14	Does using mobile phone help you to overcome the bad moods (e.g., feeling of inferiority, helplessness, guilt, anxiety, depression etc.)?	256	68.09
Q15	Do you feel guilty about the expenditure on (or excessive use of) mobile phone?	219	58.24
Q16	Do you get irritated in the morning if you are not able to locate your mobile phone?	221	58.78
Q17	Do your families/friends/colleagues complain that your mobile phone use is excessive?	214	56.91
Q18	Do you get annoyed or shout if someone asks you to decrease the use of mobile phone?	166	44.15
Q19	Do you frequently participate in SMSs or phone entry competitions?	91	24.20
Q20	Do you think you are getting addicted to mobile use?	246	65.43

Table No. 02– Criteria for mobile phone dependence

Sr	ICD-10 Criteria	Number (N=376)	%
1	Intense Desire (Q1)	148	39.36
2	Impaired Control (Q3, Q8, Q11, Q19)	142	37.77
3	Withdrawal (Q10, Q13, Q16)	9	2.39
4	Tolerance (Q2)	82	21.81
5	Decreased pleasure (Q5, Q6, Q7, Q17)	74	19.68
6	Harmful use (Q12)	111	29.52
7	MPD (respondent fulfilling 03/more of above 06 criteria)	78	20.74

Table 03 explores the association between MPD and various demographic and behavioural factors. While no statistically significant association was found between MPD and gender ($p = 0.31$) or the duration of phone usage in years ($p = 0.25$), a significant relationship was observed with the time spent on mobile phones per day ($p < 0.001$). On average, individuals with MPD spent more hours on their phones daily compared to those without MPD. Additionally, a marginally significant association was noted with the type of family structure ($p = 0.0011$), where students from nuclear and single-parent families showed a higher prevalence of MPD. Parental occupation also showed a trend toward significance ($p = 0.054$), suggesting potential influence from socioeconomic factors. These findings emphasize the multifactorial nature of mobile phone dependence. The significant role of time spent on mobile devices underscores the need for targeted strategies promoting responsible usage. Educational institutions should consider implementing awareness programs, establishing phone-free study environments, and encouraging digital detox initiatives. Cognitive-behavioural interventions, such as Rational Emotive Behavioural Therapy (REBT), could effectively address emotional regulation issues linked to phone dependence. Further research is warranted to explore tailored interventions addressing different academic years and family contexts, given the associations identified.

Table No. 03 – MPD and possible various related parameters

Parameter		MPD (N=78)	No MPD (N=298)	Total N
Gender	Male	52	183	235
	Female	26	115	141
Year	FY	32	96	128
	SY	46	202	248
Time spent on mobile phone / day (hours, average)	Male	4 ± 0.798	3 ± 0.541	-
	Female	2 ± 0.652	2 ± 0.973	-
Phone usage (in Years)	Less than 03	21	59	80
	More than 03	57	239	296
Occupation of parents	Farmer	4	226	230
	Service	37	12	49
	Business	32	9	41
	Labour	2	36	38
	Other	3	15	18
Type of Family	Joint	11	215	226
	Nuclear	26	56	82
	Single parent	41	27	68

Discussion

The current study revealed that 20.74% of students met the ICD-10 diagnostic criteria for Mobile Phone Dependence (MPD), indicating a notable prevalence of problematic mobile phone use among the sample population. This finding underscores the growing significance of MPD as a public health concern, particularly among young adults and students. Consistent with prior research, emotional regulation was a key driver, as 68.09% of participants reported using mobile phones to alleviate negative moods. Impaired control, with unsuccessful attempts to reduce usage, was also prevalent (50.53%). These patterns reflect addiction-like behaviors and reinforce the need for targeted interventions to mitigate dependence. The study's results also highlighted significant associations between MPD, and daily time spent on mobile phones ($p < 0.001$), with those exhibiting MPD averaging more hours of usage compared to non-MPD individuals. Family structure emerged as another influential factor, with students from

nuclear and single-parent families showing a higher prevalence of MPD ($p = 0.0011$). Although no significant association was found between MPD and gender or phone usage duration, the relationship with time spent on phones suggests that excessive use is a critical determinant of dependency. Similar to findings from George et al., the behavioural consequences of MPD in this study included symptoms such as irritability, anxiety, and feelings of guilt related to phone usage. The documented use of phones for emotional regulation aligns with studies linking mobile dependence to psychological distress, sleep disturbances, and reduced face-to-face social interactions. Additionally, this study aligns with observations by Dixit et al., who noted a correlation between higher academic stress and increased mobile phone use among students. In contrast to some prior studies, the lack of a significant gender difference in MPD prevalence may suggest evolving patterns of technology use that transcend traditional gender norms. Furthermore, while the relationship between MPD and socioeconomic factors, as indicated by parental occupation, approached significance ($p = 0.054$), further research is needed to establish a clearer connection. These findings highlight the urgent need for preventive strategies to address mobile phone dependence among students. Cognitive-behavioural interventions, including Rational Emotive Behavioural Therapy (REBT), could help students develop healthier coping mechanisms for emotional regulation. Educational institutions should implement awareness campaigns, promote responsible phone use, and create phone-free zones to reduce distractions and enhance academic focus. Digital detox initiatives and structured policies can further support students in managing their screen time effectively. Although this study provides valuable insights, its limitations include a cross-sectional design and reliance on self-reported data, which may introduce bias. Additionally, the single-institution sample limits the generalizability of the findings. Future research should involve longitudinal studies with diverse populations to better understand the long-term impacts of MPD and evaluate the effectiveness of intervention strategies tailored to different student demographics and academic pressures.

Conclusion

In conclusion, this study identified that 20.74% of undergraduate students exhibited Mobile Phone Dependence (MPD) according to ICD-10 criteria, highlighting a significant behavioural health issue within the student population. The high prevalence of emotional regulation through mobile phone use and the common experience of impaired control

indicate the necessity for comprehensive preventive measures. Effective interventions such as cognitive-behavioural strategies, including Rational Emotive Behavioural Therapy (REBT), awareness campaigns, and digital wellness programs, are essential to address this growing concern. Educational institutions must prioritize proactive policies to promote balanced technology use and minimize the negative impact of mobile phone dependence on students' academic performance, mental health, and social well-being. Future research with larger and more diverse samples can offer deeper insights into the progression and management of MPD among healthcare students and professionals.

Acknowledgements

The authors are thankful to Principal, R.C. Patel Institute of Pharmaceutical Education and Research, Shirpur, and Principal, R.C. Patel Institute of Pharmacy, Shirpur, Dist. Dhule (MS) India- 425 405 for providing necessary library facilities. We sincerely thank all the participants of this study. We sincerely thank all the participants of this study. We earnestly acknowledge the authorities for providing supports and facilities for this study.

References

[1] World Health Organization (WHO). Dependence Syndrome by WHO. Available at http://www.who.int/substance_abuse.

[2] World Health Organization, 2018. International Classification of Diseases for Mortality and Morbidity Statistics (11th Rev). Retrieved from. https://icd.who.int.

[3] American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, 5th edition.

[4] Statista. Number of smartphone users worldwide from 2014 to 2020 (in billions) by Statista 2018 Available at https://www.statista.com/number-of-smartphone-users-worldwide.

[5] Khan MN, Nock R, Gooneratne NS. Mobile Devices and Insomnia: Understanding Risks and Benefits. Curr Sleep Med Rep. 2015 Dec;1(4):226-231.

[6] Neupane S, Ifthikar A, Mathew A. Text Neck Syndrome - Systematic Review. Imperial Journal of Interdisciplinary Research. 2017;3(7):142-47.

[7] Sadagopan AP, Manivel R, Marimuthu A, Nagaraj H, Ratnam K, et al. (2017) Prevalence of Smart Phone Users at Risk for Developing Cell Phone Vision Syndrome among College Students. J Psychol Psychother 7:299.

[8] World Health Organization (WHO). Gaming disorder. Available at http://www.who.int/features/qa/gaming-disorder/en/.

[9] Young, K.S., 1996. Psychology of computer use: XL. Addictive use of the Internet: a case that breaks the stereotype. Psychol. Rep. 79, 899–902. doi.org/10.2466/pr0.1996.79.3.899.

[10] Pan, Y., Chiu, Y., & Lin, Y. (2020). Systematic review and meta-analysis of epidemiology of internet addiction. Neuroscience & Biobehavioural Reviews, 118, 612–622. https://doi.org/10.1016/j.neubiorev.2020.08.013.

[11] Sonar N, Jadhav PR, Jadhav MS., Prevalence of Mobile Phone Dependence (MPD) among Medical Students: An Observational study. Indian J Med Res and Pharm Sci. 2021; 08(05):10-15.

[12] Nikhita CS, Jadhav PR, Ajinkya S. Prevalence of mobile phone dependence in secondary school adolescents. J Clin Diagn Res. 2015;9:VC06–9.