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A Study of Nomophobia and Its Relationship with Screen Time, Anxiety, and Depression Among Medical and Paramedical Students in Central India: A Facility-Based Observational Study

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ABSTRACT

Background- This study was conducted to determine the prevalence of nomophobia among university students and to identify psychosocial factors associated with nomophobia.

Methodology- This study was conducted as a cross-sectional study among a sample of 150 medical or paramedical university students in Central India over the study period of 3 months

i.e. from 1st October 2024 to 25th December 2024. History regarding sociodemographic variables and screen time was obtained and documented in proforma. Presence of nomophobia was assessed using Nomophobia Questionnaire (NMP-Q) whereas assessment of anxiety and depression was done using Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9) respectively.

Results- Screen time was more than 4 hours in approximately half of the students (49.3%). We observed nomophobia in 96% students, with mild, moderate and severe nomophobia in 24%, 57.3% and 14.7% participants respectively. Our study found a significant association of higher screen time with nomophobia and depression ($p<0.05$). We observed a significant association of nomophobia with higher severity of depression ($p<0.05$). However, no such association was found with anxiety ($p>0.05$). Our study found a low positive correlation of nomophobia with screen time and depression ($r=0.30$-0.50; $p<0.05$), however, nomophobia showed negligible but significant correlation with anxiety ($r=0.278$; $p<0.05$).

Conclusions- Nomophobia is common among medical and paramedical students of Central India and is an emerging mental health condition. Higher screentime is significantly associated with nomophobia and presence of depression whereas nomophobia is associated with higher risk of depression in medical and paramedical students.

Keywords: Nomophobia, screen time, anxiety, depression, mental health, psychosocial health, medical students, paramedical students

INTRODUCTION

Digital technologies have profoundly altered people's lives through the facilitation of online education, communication, network access, and cooperation. Smartphones have significantly impacted people's everyday lives and have become essential in lives of every individual, especially for students.[1,2] These gadgets have a wide range of functions, such as social networking, video streaming, music playing, gaming and internet browsing, apart from calling.[2,3] Additionally, smartphones have the potential to be used as teaching and learning aids. Smartphones are particularly useful for self-directed learning for students, who can overcome time and location limitations.[3-5]

In order to avoid anxiety or withdrawal, people may use their phones more frequently, which can lead to an increase in screen time.[6] On the other hand, research suggests that cellphones may encourage addictive and potentially harmful antisocial behavior.[7] Nomophobia, also known as "NO MObile PHone phoBIA," is a form of technological addiction brought on by excessive and problematic mobile phone use. Some have even suggested that nomophobia is an emerging type of psychiatric disease.[8,9] The term nomophobia was coined in 2008, a UK-based research organization assessing the anxieties experienced by mobile phone users. It was noted that nomophobia seems to be common in the modern world. Estimates of the total prevalence of nomophobia range from 15.2% to 99.7%, depending on age, gender, internet access, and the amount of time spent using a smartphone each day.[11]

According to Bragazzi et al., Nomophobia should be included in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V).[12] When people with nomophobia are separated from their cellphones for any reason, such as signal loss or low battery, they suffer anxiety and fear. They even keep their phones close at hand when they sleep and regularly check them for notifications. Furthermore, research indicates that nomophobia may have detrimental effects on one's physical and mental well-being, since it has been linked to musculoskeletal problems, stress, anxiety, insomnia, sadness, and loneliness.[9,13] Numerous investigations have scrutinized the associations between clinical psychopathologies and nomophobia. Among the clinical variables, depression and anxiety have garnered the most attention.[1,14] This study was thus conducted at our tertiary care center to determine the prevalence of nomophobia among university students and to identify psychosocial factors (anxiety, depression, screen time,) associated with nomophobia. We also investigated the relationship between nomophobia and psychological well-being, focusing on anxiety and depression.

MATERIALS AND METHODS

This study was conducted as a cross-sectional study among a sample of 150 medical or paramedical university students in Index medical college hospital and research centre Indore over the study period of 3 months i.e. from 1st October 2024 to 25th December 2024. The study included undergraduate and

postgraduate students of both genders from Malwanchal university fulfilling the inclusion and exclusion criteria after obtaining ethical clearance from the Institute's ethical committee and consent from the participants. All the undergraduate or postgraduate students having smartphone enrolled at University belonging to age range of 18 to 40 years were included whereas students with diagnosed psychiatric disorders or currently receiving psychological treatment were excluded from the study.

History regarding sociodemographic variables and screen time was obtained and documented in proforma. Presence of nomophobia was assessed using Nomophobia Questionnaire (NMP-Q), a 20-item self-report measure with 7 point likert scale designed to assess the severity of nomophobia. It covers four dimensions: not being able to communicate, losing connectedness, not being able to access information, and giving up convenience.[15] The lowest score is 20 and highest is 140. Nomophobia was classified as

- No nomophobia- NMP-Q score of 20
- Mild nomophobia- NMP-Q score of 21 to 60
- Moderate nomophobia- NMP-Q score of 60 to 100
- Severe nomophobia- NMP-Q score of 100 or above

Assessment of anxiety and depression was done using Generalized Anxiety Disorder-7 (GAD-7)[16] and Patient Health Questionnaire-9 (PHQ-9)[17] respectively. GAD-7 is a seven-item self-report scale used to measure anxiety symptoms over the past two weeks whereas PHQ 9 is a nine-item self-report instrument used to assess depressive symptoms over the past two weeks.

STATISTICAL ANALYSIS

Data was entered in MsExcel and analysis was done using IBM SPSS (Statistical Package for social sciences) software version 20 (IBM Corp. Illinois, Chicago). Categorical variables were represented as frequency and percentage whereas continuous normally distributed and non normally distributed variables were expressed as mean and standard deviation or median and interquartile range respectively. Presence and severity of nomophobia was done using NMP-Q. Association of nomophobia with screentime, anxiety and depression was done using chi square test for categorical variables and one way ANOVA for normally distributed continuous variables and Kruskall Wallis test for non normally distributed data. Correlation of Nomophobia with screentime, GAD7 scale and PHQ-9 score was done using Pearson's correlation coefficient and was interpreted as

Correlation values	Interpretation
+0.9 to 1 (-0.9 to-1)	Very high positive (negative correlation)
+0.7 to 0.9 (-0.7 to -0.9)	High positive (negative correlation)
+0.5 to 0.7 (-0.5 to -0.7)	Moderate positive (negative correlation)
+0.3 to 0.5 (-0.3 to -0.5)	Low positive (negative correlation)
+0.0 to 0.3 (-0.0 to -0.3)	Negligible positive (negative correlation)

P value of less than 0.05 was considered significant.

RESULTS

This study was conducted on a total of 150 medical and paramedical students with mean age of 22.08±2.35 years. About 60% of students were females and 72% of the participants were MBBS students. Majority of students used smartphone for accessing social media (68%). Screen time was more than 4 hours in approximately half of the students (49.3%). We observed nomophobia in 96% students, with mild, moderate and severe nomophobia in 24%, 57.3% and 14.7% participants respectively. Mild to severe depression was noted in 66.7% participants and mild to severe anxiety was observed in 57.3% students (Tabe 1).

Table 1- Distribution of study participants according to baseline variables

Baseline variables		Frequency (n=150)	Percentage
Age (years)	Mean±SD (Range)	22.08±2.35 (18-32)	
Gender	Male	60	40.0
	Female	90	60.0
Study field	BDS	36	24.0
	Biotech	2	1.3
	Nursing	3	2.0
	MBBS	108	72.0
	MD	1	0.7
Use of smartphone	Social media	102	68.0
	Calling	55	36.7
	Messaging	38	25.3
	Gaming	20	13.3
	Other	36	24.0
Screentime	<1 hour	12	8.0
	1-2 hours	17	11.3
	2-4 hours	47	31.3
	>4 hours	74	49.3
Nomophobia	Absent	6	4.0
	Mild	36	24.0
	Moderate	86	57.3
	Severe	22	14.7
	Mean±SD (range)	72.89±26.92 (20 to 140)	
Depression	Absent	14	9.3
	Minimal	36	24.0
	Mild	45	30.0
	Moderate	30	20.0
	Moderately severe	17	11.3
	Severe	8	5.3

	Median (IQR)	8 (3-11)	
Anxiety	Minimal	64	42.7
	Mild	49	32.7
	Moderate	24	16.0
	Severe	13	8.7
	Median (IQR)	6 (1.75-9.25)	

Our study found a significant association of higher screen time with nomophobia and depression as observed in table 2.

Table 2- Association of nomophobia, depression and anxiety with screentime

Variables		Screentime				P value
		<1 hour (n=12)	1-2 hours (n=17)	2-4 hours (n=47)	>4 hours (n=74)	
Nomophobia	Absent	4 (33.3%)	0 (0%)	1 (2.1%)	1 (1.4%)	0.001*
	Mild	3 (25%)	7 (41.2%)	8 (17%)	18 (24.3%)	
	Moderate	5 (41.7%)	9 (52.9%)	33 (70.2%)	39 (52.7%)	
	Severe	0 (0%)	1 (5.9%)	5 (10.6%)	16 (21.6%)	
	Median (IQR)	45 (20-80.25)	62 (48-72)	74 (64-91)	79 (59-94.25)	0.003*
Depression	Absent	5 (41.7%)	3 (17.6%)	4 (8.5%)	2 (2.7%)	0.007*
	Minimal	1 (8.3%)	4 (23.5%)	14(19.8%)	17 (23%)	
	Mild	4 (33.3%)	5 (29.4%)	17 (36.2%)	19 (25.7%)	
	Moderate	1 (8.3%)	3 (17.6%)	5 (10.6%)	21 (28.4%)	
	Moderately severe	1 (8.3%)	2 (11.8%)	6 (12.8%)	8 (10.8%)	
	Severe	0 (0%)	0 (0%)	1 (2.1%)	7 (9.5%)	
	Median (IQR)	4.5 (0-8.75)	8 (1.5-10)	6 (3-11)	9 (4-12)	0.024*
Anxiety	Minimal	6 (50%)	7 (47.1%)	23 (48.9%)	28 (37.8%)	0.619
	Mild	3 (25%)	8 (47.1%)	14 (29.8%)	24 (32.4%)	
	Moderate	2 (16.7%)	2 (11.8%)	8 (17%)	12 (16.2%)	
	Severe	1 (8.3%)	0 (0%)	2 (4.3%)	10 (13.5%)	
	Median (IQR)	4.5 (0-9.5)	6 (0-9)	5 (2-7)	6.5 (2-11)	0.384

As observed from table 3, we observed a significant association of nomophobia with higher severity of depression ($p<0.05$). However, no such association was found with anxiety ($p>0.05$).

Table 3- Association of Nomophobia with anxiety and depression

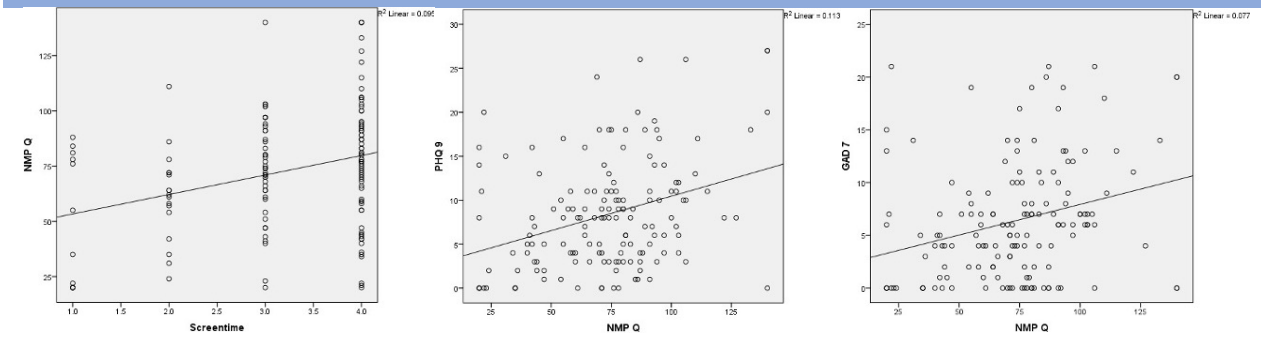
Variables		Nomophobia				P value
		Absent (n=6)	Mild (n=36)	Moderate (n=86)	Severe (n=22)	
Depression	Absent	3 (50%)	5 (13.9%)	5 (5.8%)	1 (4.5%)	0.006*
	Minimal	0 (0%)	12(33.3%)	22 (25.6%)	2 (9.1%)	
	Mild	1 (16.7%)	11 (30.6%)	28 (32.6%)	5 (22.7%)	
	Moderate	1 (16.7%)	4 (11.1)	17 (19.8%)	8 (36.4%)	
	Moderately severe	1 (16.7%)	3 (8.3%)	11 (12.8%)	2 (9.1%)	
	Severe	0 (0%)	1 (2.8%)	3 (3.5%)	4 (18.2%)	
	Median (IQR)	4 (0-14.5)	5 (2-9)	8 (4-11)	11 (7.75-17.25)	0.04*
Anxiety	Minimal	3 (50%)	20 (55.6%)	37 (43%)	4 (18.2%)	0.162
	Mild	1 (16.7%)	12 (33.3%)	26 (30.2%)	10(45.5%)	
	Moderate	1 (16.7%)	2 (5.6%)	17 (19.8%)	4 (18.2%)	
	Severe	1 (16.7%)	2 (5.6%)	6 (7%)	4 (18.2%)	
	Median (IQR)	3 (0-13.5)	4 (0.25-7)	6 (2-10)	7 (6-13.25)	0.27

Table 4- Correlation of nomophobia with screen time, anxiety and depression

Nomophobia with	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
Screentime	0.308	0.095	0.089	0.898	15.476	0.0001
Depression	0.336	0.113	0.107	5.926	18.827	0.0001
Anxiety	0.278	0.077	0.071	5.418	12.392	0.001

Our study found a low positive correlation of nomophobia with screen time and depression ($r=0.30$-0.50; $p<0.05$), however, nomophobia showed negligible but significant correlation with anxiety ($r=0.278$; $p<0.05$) (Table 4; Figure 1).

Figure 1- Correlation of nomophobia with screen time, anxiety and depression



DISCUSSIONS

Researchers have focused on the idea of behavioral addiction, which is seen to be comparable to drug dependency as defined by the existing nomenclature.[18-20] Mobile phone dependency, problematic use, and mobile phone misuse are among terms that have been used to describe nomophobia.[21] The psychological basis of mobile phone behavior of young people are not well understood. According to studies, younger individuals are more prone to exhibit addictive patterns in their mobile phone use.[22] This cross-sectional study was thus conducted to determine nomophobia among students, which was prevalent in 96% of medical and paramedical students and majority of students had moderate nomophobia (57.3%), followed 24% students having mild nomophobia. About 14.7% students had severe nomophobia. These findings were supported by the findings of Bartwal et al, in which 100% medical students enrolled in the study had nomophobia and among them, 67.2% students had moderate nompphobia.[23] Sethia et al in their study in medical students of Bhopal reported nomophobia in 99.8% students, and majority of them had moderate nomophobia (61.5%).[24] These findings are in line with a 2023 meta-analysis of 52 publications that showed that 90% students had nomophobia, 20% of adolescents and young adults had mild nomophobia, 50% have moderate nomophobia, and 20% have severe nomophobia.[25] Furthermore, a thorough analysis of 27 publications revealed the notable and alarming prevalence of nomophobia among nursing students.[26] Additionally, nomophobia is particularly common among nursing and medical students, according to a 2020 systematic review of 42 publications.[27]

According to a study done by Sureka et al, anxiety that arises from being separated from wireless mobile devices (WMDs) may be a significant element of a psychological dependence linked to excessive usage of these gadgets. The authors found a strong correlation between nomophobia and anxiety and stress. It is challenging to determine whether excessive mobile phone use is the cause of anxiety and depression or if anxiety causes nomophobia. The issue was made worse by cell phone withdrawal symptoms. According to the authors findings, students not able to use their phones experience more stress, which can result in anxiety and depression.[14] Spending more time on screens also means less time for healthy real-world activities that support mental health, such as physical activity, introspection, and meaningful, face-to-face interactions with others. It is hardly surprising, given all of this, that studies indicate that spending less time on social media improves wellbeing.[15] Screentime of more than 4 hours was significantly associated with presence of nomophobia and our study documented a weak positive correlation of nomophobia with screentime ($r=0.308$; $p<0.05$). This is corroborated by the findings of other studies that found a substantial correlation between nomophobia scores and the number of hours spent using smartphones, suggesting that

higher nomophobia scores are associated with longer smartphone usage hours.[28-31] The degree of nomophobia and smartphone addiction are significantly correlated, according to a 2023 meta-analysis of 16 publications.[32]

In our study, we found a significant association of higher screentime as well as higher severity of nomophobia with higher severity of depression. Median PHQ 9 scores were found to be significantly higher in students with severe nomophobia as compared to students with no or mild nomophobia. A low positive correlation of nomophobia with depression ($r=0.336$; $p<0.05$) was reported in our study. The present study found no significant association as well as correlation of nomophobia with anxiety. The findings of present study were conco`rdant with the findings of Sureka et al, in which the authors found a significant association of depression with nomophobia i.e., the prevalence of nomophobia was 1.22 (1.01–1.45) times higher in depressed individuals than in non-depressed individuals, with a statistically significant ($p<0.05$). The prevalence of nomophobia was 1.14 (0.92-1.41) times higher among individuals who experienced anxiety than among those who did not, but the association was statistically insignificant.[14] Depression and anxiety showed a positive correlation with nomophobia according to a study conducted by Sharma et al.[21] Nomophobia has been found to co-occur with depression and dysthymia, alcohol and other substance use disorders, panic disorder, social phobia obsessive-compulsive disorder, eating disorders, and other behavioral addiction disorders (such as compulsive shopping, gambling, online gaming, mobile and/or Internet dependence, and sexual behaviors). One may hypothesize that depresed teenagers could look for social media sites or "apps" to make them feel better about themselves and less alone. On the contrary, adolescents who use these "apps" to view the lives of others as superior to their own are likely to experience worsening symptoms of anxiety and depression.[21]

Our study had certain limitations, first, this was an observational cross sectional study and hence we could establish only association of nomophobia with screen time and depression but causality could not be determined. Secondly, the questionnaire used were mainly self reported, which may have the possibility of response bias.

CONCLUSIONS

Nomophobia is common among medical and paramedical students of Central India and is an emerging mental health condition. Higher screentime is significantly associated with nomophobia and presence of depression whereas nomophobia is associated with higher risk of depression in medical and paramedical students.

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