Research Article

Assessing Smartphone Addiction Among Pakistani Medical & Engineering University Students; A Cross Sectional Study

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Abstract

Background: Nowadays, Smartphone addiction is recognized as a significant public health concern. This universal issue has lead to a psychiatric condition termed "nomophobia" arising from excessive smartphone usage and dependency on it.

Objective: The present study sought to evaluate the frequency of nomophobia among Pakistani university students of engineering and medicine. It also explored the potential association of influence of gender on the occurrence of Nomophobia.

Materials and Methods: It is a Cross-sectional study conducted in public and private medical and engineering varsities of Multan and Rawalpindi from January 2023 to July 2023. A sample of 258 medical and engineering students completed a questionnaire with sections on demographics, mobile phone use, and the standardized NMP-Q scale's 20 items. The respondents were classified as having a mild, moderate, or severe nomophobia based on their overall NMP-Q scores.

Results: The study showed that about 80% of students spent greater than 4 hours on their mobile phones. Engineering students experienced a significantly higher rate of severe nomophobia (69.9%) compared to medical students (30.1%). In terms of gender, women showed lower rates of nomophobia in all three categories than men.

Conclusion: Nomophobia is highly prevalent among the surveyed college students, particularly among distinct groups like engineering majors, where engineering enrollment shows a positive correlation with the severity of nomophobia. To address this escalating concern, targeted initiatives promoting responsible technology use according to the students' needs are vital. Further research is required to explore the gender gap and technological reliance behaviors in academic settings.

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Keywords | Nomophobia, Smartphone addiction, Students.

Introduction

Smartphone craving has become so common that it is now resembled as any other addiction to hazardous substances. Resultantly, it is a community health issue, and a new pathology known as nomophobia (No-phone phobia) is forming and being cataloged as a psychiatric disease as a result of the excessive usage of this gadget and the reliance that this technology causes.[1] Although it is not yet formally recognized as a mental disorder. It has been the subject of studies. There have been demands to include it in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V).[2] The word Nomophobia was coined in 2008 in research undertaken by the United Kingdom Postal Office, which discovered that scenarios such as phone loss, battery not charged, and forgetting their phone were all causes of fear.[3] Nomophobia is linked to poor academic performance and accomplishment.[4] Nomophobia progresses through distinct stages (initiation, affirmation, need, and dependency), like addiction, and presents in various forms, such as social and physiological and physically.[5] Nomophobia presents itself as a contemporary disorder characterized by symptoms of uneasiness, anxiety, and nervousness caused by a lack of access to cell phones, computers, and other communication devices.[6] Nomophobia is more prone to medical ailments like anxiety, shaking, insomnia,[7] migraines, respiratory changes, tachycardia and physically inactive due to their bad living

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patterns. Additionally, cell responses in the auditory and central nervous systems (CNS) can be affected as a result of electromagnetic radiation released by cell phones. Nomophobia is now a widespread problem,[8] While comprehensive research linking all these common points is yet to be conducted, each symptom has been found in smartphone addiction studies.[9]

According to Al-Mamun et al., the occurrence of nomophobia among students worldwide has attracted considerable attention. Their research revealed that 9.4% of university students experienced mild nomophobia, 56.1% experienced moderate nomophobia, and 34.5% experienced severe nomophobia. Nomophobia is quite common among university students in Bangladesh and is strongly linked to both social anxiety and fear of missing out, as well as other undesirable outcomes such as insomnia and depression.[10]

Pakistan is one of the leading countries with a significant increase in Smartphone ownership, being ranked in the top 10 countries of the world with smartphone market and users Pakistan has a total of 191.8 million active mobile connections since the beginning of 2023, or 80.5 percent of the total population[11,12]. However, despite a statistically substantial increase in the usage of cell phones in Pakistan, there is an absence of indigenous results from the Pakistani community that might be helpful in understanding nomophobia and the apparent correlation between mobile phone separation and anxiety among young adults. It is crucial to assess the extent of nomophobia and its associated factors among Pakistani students. Psychologists and medical educationists will be able to understand better about this demographic after establishing levels of nomophobia and its determinants. Importantly, viable therapeutic treatments and educational programs might be implemented at the elementary, secondary, and tertiary levels of prevention.[13]

Therefore, the primary objective of this research is to ascertain the frequency of Nomophobia, and to assess smartphone addiction among Medical & Engineering University Students of Multan and Rawalpind. The current study also aims to probe the potential influence of gender on the prevalence of Nomophobia and the correlation between them. By exploring these variables, this study seeks to elucidate the potential aspects that could contribute to the development and severity of nomophobia, thereby enhancing our understanding of this contemporary psychological issue. By shedding light on this matter, we hope to encourage healthier technology habits and reduce the impact of nomophobia on the academic and personal lives of students.

Methodology

This cross-sectional study was conducted at public and private Engineering and Medical universities of Multan and Rawalpindi under support and supervision of BMY Health, Pakistan and the data were collected from medical and engineering students of Pakistan from January 2023 to July 2023. The study was approved by the Ethical Review Committee of BMY Health (BMY-ERC1-02-2023) prior to commencing the study. The sample size was calculated using an online API calculator, sample size was estimated to be 258 participants selected from public and private universities in Multan and Rawalpindi. A hybrid approach was employed allowing participants to complete either physical or digital questionnaires and a convenient sampling technique was used to gather data. The inclusion criteria encompassed male and female engineering and medical students aged between 18 and 25 years, enrolled in public and private universities in Pakistan. Participants who did not own a smartphone or used it for lower than 4 hours daily were excluded from the study. Throughout the data collection process, strict adherence to institutional and national ethical requirements were followed. The data remained anonymous and confidential. Moreover, participation in the research was entirely voluntary, and no incentives were provided to encourage involvement in the research. The questionnaire consisted of three major sections, the first section focused on gathering demographic profile, the second section explored the use of smartphones, and the third section used a validated NMP Questionnaire (NMP-Q) which consists of 20 statements rated on a 7-point Likert scale ranging from strongly agree (7) to strongly disagree (1) 29. The scores were summed to determine the level of nomophobia. A score of 20 signifies the complete absence of nomophobia, scores ranging from 21 to less than 60 indicate mild nomophobia, scores ranging from 60 to less than 100 indicate moderate nomophobia, and scores ranging from 100 to less than 140 indicate severe nomophobia. The survey could be completed in 4-5 minutes, enabling participants to participate without significant time constraints.

Results

Among the 258 surveyed students from various medical and engineering programs, about 56.6% were males. The largest age group was 21-23 years, accounting for 82.2% of the subjects. Almost all subjects (99.6%) owned a smartphone. Nearly forty percent of respondents were in their third and fourth year of study with a significant proportion of 86% reported owning a smartphone for more than two years. About 80% of subjects spent more than 4 hours on their smartphones (Table-1).

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Table 1: *Characteristics of subjects and levels of Nomophobia*

Characteristics of subjects		Frequency	
		Count	Percent
Age	18-20 years	28	10.9
	21-23 years	212	82.2
	24-25 years	18	7
Gender	Male	146	56.6
	Female	112	43.4
Education course	Medical	129	50.0
	Engineering	129	50.0
Year of study	1st year	17	6.6
	2nd year	21	8.1
	3rd year	98	38
	4th year	103	39.9
	5th year	19	7.4Ma
Owner of smart phone	Yes	257	99.6
	No	1	0.4
Duration of ownership	Less than 1 year	8	3.1
	1 year	10	3.9
	2 years	18	7
	More than 2 years	222	86
Average time on Smartphone	Less than 4 hours	52	20.2
	More than 4 hours	206	79.8

The Nomophobia Questionnaire results indicate a significant dependence and anxiety related to smartphone usage among respondents. The median scores mostly range around 4, signifying a high level of agreement with statements related to discomfort and anxiety in the absence of a smartphone. Specifically, statements related to the inability to access information, use smartphone capabilities, and stay connected with family and friends have median scores of 5, highlighting these as critical areas of concern. Concerns about losing connection, running out of battery, data limit, or being unable to receive updates from social networks and email also score high, mostly at 4, suggesting a pervasive sense of unease about being disconnected or unable to access digital communication and information. These results underscore the deep integration of smartphones into daily life and the anxiety associated with potential disconnection.

Distribution of Nomophobia scores for 258 participants showed a mean of 82.78+25.86 with minimum score of 21 and maximum score of 140 (Fig -1).The frequency of Nomophobia among students was reported as mild in 20.5 % and moderate in 47.3%, whereas severe levels of nomophobia were determined in 32.2% of participants.

Table 1: *Scores for 20 Nomophobia questions*

Variable in Nomophobia Questionnaire	Median score*
I would experience unease in the absence of continuous access to information via my smartphone.	4
I would feel irritated if I were unable to access information on my smartphone at my convenience.	5
My anxiety would increase if I were unable to access news updates, such as current events and weather forecasts, on my smartphone.	4
I would feel irritated if I were unable to utilise my smartphone and its functionalities at my discretion.	5
Experiencing a depletion of battery power on my smartphone would instill fear in me.	4
In the event that I were to deplete my credits or reach my monthly internet limit, I would experience a state of extreme anxiety.	4
I frequently check for a data signal or Wi-Fi network if I didn't have either.	4
Without my smartphone, I'd worry about getting stranded.	4
A while without my smartphone would make me want to check it.	5
Without my smartphone, I would worry about not being able to contact family and friends.	5
Without my smartphone, I would worry about my family and friends being unable to reach me.	5
Without my smartphone, I would worry about missing texts and calls.	4
Without my smartphone, I would worry about missing family and friends.	5
I would be anxious without my smartphone since I wouldn't know if someone has tried to reach me.	4
Without my smartphone, I would have anxiety due to the disruption of my continuous communication with my family and friends.	4
Without my smartphone, I would feel anxious due to the lack of connection to my online persona.	4
Without my smartphone, I would feel uneasy as I would be unable to keep myself informed about the latest happenings on social media and internet platforms.	4
Without my smartphone, I would feel uncomfortable since I would be unable to access and review the notifications regarding changes from my contacts and online networks.	4
Without my smartphone, I would experience anxiety due to the inability to access my email messages.	4
Without my smartphone, I would experience a sense of unease due to my lack of direction.	4

*Score was given for agreement with the 20 statements in validated NMP Questionnaire (NMP-Q) and agreement was rated on a 7-point Likert scale ranging from strongly agree as 7 to strongly disagree as 1.

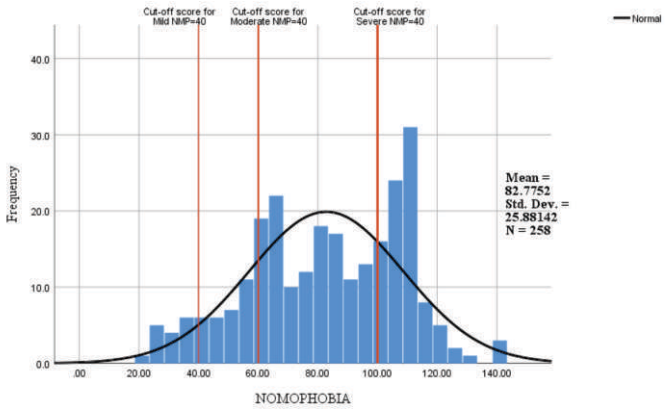

Figure 1: *Histogram showing Nomophobia Sum Scores Distribution in the sample*

There was variation in nomophobia levels between different groups, with Engineering students experiencing higher levels of severe nomophobia compared to Medical students (69.9% vs30.1%). More than half ofthe medical students (58.2%) suffered from moderate nomophobia as compared to 41.8% of Engineering students. (Table 3) Additionally, there was a gender-based difference in the distribution of nomophobia levels, with males having higher nomophobia scores compared to females however it was not statistically significant. (Table 3) The relation between education courses and nomophobia demonstrated an exceptionally low value (p 0.000) for engineering students which emphasizes a strong connectedness between Education courses of engineering and the level of nomophobia experienced by students. Moreover the nomophobia was found to be related with smartphone ownership duration with high scores among those with more than 2 years duration.

In further analysis, it was noted that nomophobia was higher in later years of medical education while among engineering students it was higher in early years also. The variability in nomophobia is evident among the years, with some outliers, particularly in the engineering group (figure 2).

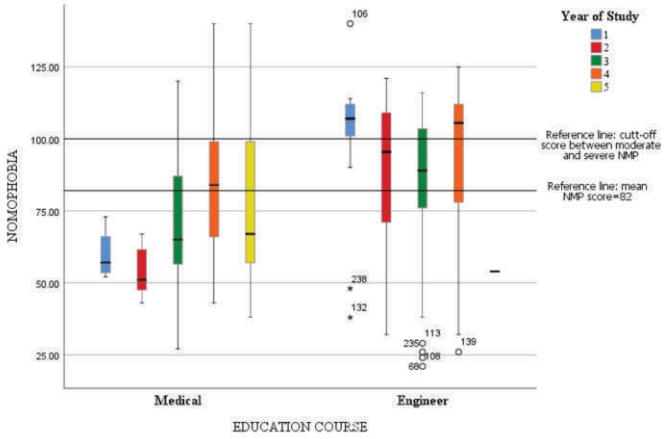

Figure 2: *Box plot illustrating nomophobia scores across different years of study for medical and engineering students.*

Discussion

In the current study, the entire sample revealed an alarmingly high levels of nomophobia among university students. The findings demonstrate that almost the whole sample population possessed a smartphone (99.6%), while 86% had used it for over two years. A significant proportion of students, precisely 80%, exhibited a notable level of nomophobia (using it for more than 4 hours), indicating substantial psychological reliance on their mobile devices thus Smartphone usage has become a necessary evil for students.[14,15]

Table 3: *Nomophobia scores in relation with Gender, Education and smartphone ownership duration*

Variables		Nomophobia categories			Nomophobia scores	
		Mild Count (%)	Moderate Count (%)	Severe Count (%)	Mean (SD)	P-value*
Education Course	Medical	33 (25.6%)	71 (55.0%)	25(19.4%)	76.84 (24.49)	< 0.001
	Engineering	20(15.5%)	51(39.5%)	58(45.0%)	88.71 (25.96)	
Gender	Male	32(21.9%)	69(47.3%)	45(30.8%)	81.64 (25.68)	0.424
	Female	21(18.8%)	53(47.3%)	38(33.9%)	84.25 (26.18)	
Duration of smartphone ownership?	< 1 Year	3(37.5%)	5(62.5%)	0(0.0%)	69.75 (22.17)	0.41
	1 Year	3(30.0%)	5(50.0%)	2(20.0%)	79.5 (21.17)	
	2 Years	4(22.2%)	12(66.7%)	2(11.1%)	79.0 (20.67)	
	> 2 Years	43(19.4%)	100(45.0%)	79(35.6%)	83.7 (26.53)	
Year of Study	1	5(29.4%)	2(11.8%)	10(58.8%)	89.94 (29.61)	.053
	2	8(38.1%)	7(33.3%)	6(28.6%)	75.62 (28.41)	
	3	20(20.4%)	53 (54.1%)	25(25.5%)	79.29 (25.19)	
	4	13 (12.6%)	52 (50.5%)	38(36.9%)	87.53 (24.49)	
	5	7 (36.8%)	8 (42.1%)	4 (21.1%)	76.47 (26.92)	

*p-value calculated for comparing NMP total score among categories using t-test and ANOVA where applicable.

The dynamics of our study classified the prevalence of nomophobia into three categories i.e mild, moderate and severe in accordance with NMP Questionnaire. The prevalence of nomophobia was higher in males compared to females in each category: mild (60.4%vs39.6%), moderate (56.60% vs 43.40%), and severe (54.20% vs 45.80%). Some recent studies supported a pattern that women use smartphones more frequently for emotional support and interpersonal communication.[16-20] Males show higher engagement in entertainment apps, including games, video, and music apps, whereas females are more inclined to use mobile phone communication functions and social networking services.[21] Some previous studies showed that the constant connectivity offered by phones may foster deeper bonds and trigger anxiety related to disconnection particularly in the in female users.[22,23]

Our study indicated that engineering students experience a significantly higher level of severe nomophobia (69.9%) than medical students (30.1%). One possible explanation for this difference is the extensive use of mobile devices in engineering coursework, involving technical tasks including programming, designing, simulating, and computing.[24] The widespread use of phones in engineering processes could potentially be more stressful when these devices are unavailable. In contrast, medical fields rely less on mobile technology in their daily tasks thus the prevalence of nomophobia due to continuous connectivity in young people who have grown up in a digital age raises concerns.[25]

A study conducted in Turkey showed that the severity of nomophobia positively correlates with engineering course enrollment.[26] However, more evaluation is needed to explore the gender gaps with rates of nomophobia. A study done in India highlighted the notable reliance of engineering students on mobile devices, emphasizing the importance of targeted interventions to tackle this matter effectively in the utmost best possible manner.[27] Another study from India showed how the intersection of gender, discipline, and technology dependence shapes the experiences of university students in the digital age. Appropriate balance is crucial for students' progress and well-being.[28]

The elevated rates of nomophobia identified through current study underscore the imperative to implement proactive measures to address nomophobia. It is essential for promoting students' well-being, interpersonal connections, and scholastic accomplishments, particularly given the growing integration of mobile technologies into their daily lives. Development and evaluation of targeted therapies for subgroups with the highest risk of nomophobia is essential.

The study's inherent cross-sectional design presents limitations in establishing causal relationships between nomophobia and its related factors, it is important to note that significant factors like smartphone addiction and social media use were not assessed in the study, which posed challenges in identifying the root causes of nomophobia. Additionally, the study might have encompassed some potential confounding variables like an individual's socioeconomic status, previous technology exposure, and methods for managing stress, which can potentially alter the results, demand thorough exploration.

Conclusion

Our study findings show that nomophobia is prevalent among university students of both genders and different academic disciplines. Engineering students demonstrate greater reliance on mobile devices, leading to higher rates of severe nomophobia than their medical counterparts. However, the absence of correlation between gender and nomophobia suggests that gender may not be a fundamental driver of nomophobia intensity.

To address the issue of excessive dependence on mobile devices among young individuals, it is vital to implement targeted interventions that promote healthy phone usage. These interventions should be precisely tailored to the unique needs and characteristics of this demographic. By taking this approach, we can successfully limit the negative outcomes associated with excessive reliance on mobile devices.

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