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PREVALENCE OF NOMOPHOBIA AND ITS ASSOCIATION WITH ANXIETY, STRESS AND LONELINESS IN UNDERGRADUATE STUDENTS IN A MEDICAL COLLEGE IN KANPUR: A CROSS-SECTIONAL STUDY

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Abstract

Background: Nomophobia, the fear of being without a mobile phone, is increasingly prevalent among young adults, particularly in academic settings. Its excessive use has been linked to significant psychological issues, including anxiety, stress, and loneliness, underscoring the need to understand its impact on students' mental health.

Aim: This cross-sectional study aimed to assess the prevalence of nomophobia and its association with anxiety, stress, and loneliness.

Methods: Data were collected using the Nomophobia Questionnaire (NMP-Q), Depression Anxiety Stress Scale-21 (DASS-21), and UCLA Loneliness Scale Version 3 (UCLA LS3) among 470 undergraduate medical students at Rama Medical College, Hospital & Research Centre, Kanpur. Statistical analyses, including Pearson correlation and Chi-Square tests, were conducted to explore relationships between nomophobia and psychological distress.

Results: The study revealed a moderate level of nomophobia, with a mean NMP-Q score of 64.19 ± 14.53. The incidence was higher among first and second-year students. Gender differences were noted, with male students reporting higher mean scores for nomophobia and loneliness. Significant positive correlations were found between nomophobia and anxiety ($r = 0.81$, $p < 0.05$), stress ($r = 0.84$, $p < 0.05$), and loneliness ($r = 0.47$, $p < 0.05$), indicating that nomophobia is strongly associated with these psychological factors, especially in the early years of medical education.

Conclusion: Nomophobia is prevalent and is linked to higher levels of anxiety, stress, and loneliness. Addressing these issues through targeted mental health interventions, including digital detoxification programs and stress management strategies, could help reduce its negative impact on students' well-being.

Keywords: Nomophobia, Anxiety, Stress, Loneliness, Medical Students, Psychological Distress

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Introduction

In the 21st century, digital connectivity has become essential, with rapid technological advances driving global progress. Smartphones now shape our daily lives and behaviors, constantly accompanying us. Wireless networks have expanded significantly, evolving from basic phone connections to enabling internet banking, social networking, messaging, and more. Amidst this technological growth, a silent epidemic known as Nomophobia has emerged.

Nomophobia, short for "NO MObile PHOne phoBIA," is defined as the fear or anxiety experienced when individuals are unable to use their mobile phones or are without them, resulting in feelings of discomfort or distress. This condition encompasses anxieties related to losing signal, running out of battery, or being in a situation where one cannot access their mobile device.[1] Nomophobia is characterized by an irrational fear of being without one's smartphone, often resulting in heightened anxiety, psychological distress, and physiological responses such as tachycardia, hyperhidrosis, and agitation. The term was first coined in 2008 during a study commissioned by the UK Post Office, which revealed that a substantial portion of the population experiences anxiety when they are unable to connect to their mobile devices.[2]

Smartphones have become vital tools for communication and information, especially for medical students. While they aid in accessing medical literature and educational resources, excessive use can lead to addiction-like behaviors and psychological distress, such as nomophobia—the fear of being without a phone. Despite their educational benefits, smartphones can also cause distractions and negatively affect academic performance. A study from Bhavnagar found that 92.7% of medical students were highly involved with their mobile phones, with significant portions reporting distress when separated from their devices.[3]

Among students, especially those in demanding environments like medical schools, loneliness can emerge due to academic pressures, geographic relocation, and changes in social dynamics. According to Cacioppo et al. (2015), loneliness is more than just the absence of social networks; it reflects a subjective experience of social isolation and perceived inadequacy of meaningful social interactions[4]. Research by Elhai et al. (2017), have demonstrated that students often use smartphones to mitigate feelings of loneliness by maintaining constant virtual contact with their social circles. However, paradoxically, higher smartphone usage may worsen feelings of loneliness by replacing face-to-face interactions with superficial online engagements, reinforcing social isolation over time[5]. Stress is often triggered by the demands of constant connectivity, where individuals feel the need to remain updated and respond instantly to messages, social media, or academic notifications [6]. For medical students, who already experience high levels of academic stress, this reliance on smartphones adds an additional burden, particularly in contexts like nomophobia where students fear losing access to vital tools for both social and educational purposes. Extended periods of phone use have been found to exacerbate stress by disrupting sleep patterns, increasing cognitive load, and contributing to feelings of being overwhelmed (Murray & Campbell, 2015)[7].Students with high smartphone dependence often experience increased anxiety when unable to access their phones, driven by fears of missing information, losing social status or disconnecting from support. Compulsive phone checking, even in academic or social settings, reinforces anxiety through the brain's reward pathways.[8]

The association between nomophobia and mental health issues involves several psychiatric factors. Dependence on smartphones for social interaction can trigger anxiety and depression through Fear of Missing Out (FOMO) when disconnected. Cognitive overload from constant exposure to information and notifications may heighten anxiety and depressive symptoms. Increased screen time, particularly before sleep, disrupts sleep patterns, contributing to a cycle of insomnia, anxiety, and depression. Additionally, individuals with low self-esteem may rely on their smartphones for validation, further exacerbating their anxiety and depressive tendencies.[5]

Researches shows that young adults, especially college students, are more prone to smartphone dependency than older adults. This dependence often interferes with academic performance, personal activities, and social interactions. The rising smartphone usage among students highlights a growing trend that can affect their relationships and daily functioning.[9 10 11] Several researches on nomophobia, has also been conducted, one of such research conducted in Indore in a medical college among 200 medical students aged 17-28 years, 18.5% were nomophobes, 73% keep their phones with them 24/7, even while sleeping and 20% feel stressed or lose concentration without their phone or when the battery dies[12]. In a study conducted by Pavithra et al 2015 ,200 medical students, about 23% students felt they lose concentration and become stressed when they do not have their mobile around, 79(39.5%) students were Nomophobic [13.] Another research conducted by Sharma N. et al in Indore in a medical college among 130 medical students aged 20-24, showed 73% of students were nomophobics. 83% of students experienced panic attacks when their mobile phone was misplaced[14].A cross-sectional study of 429 medical students in Kerala (Madhusudan et al., 2017) found that 97% exhibited nomophobia, with 33.3% having mild, 56.2% moderate, and 7.5% severe levels. Nomophobia was more prevalent among females (28.66%) than males (20.68%), though males had a higher risk (45.21% vs. 39.59%). Significant gender differences were observed: males experienced more anxiety about low battery and staying updated on social media, while females reported more sleep disruption from nighttime phone use. Females also used phones less for educational purposes and more to avoid loneliness in public settings compared to males[15]. Research indicates that medical students in India exhibit high levels of mobile phone usage. A study in Delhi found that nearly 40% of medical students displayed addiction-like behaviors associated with mobile phone usage [16] . A study at AIIMS Patna reported that 97.5% of medical students exhibited some level of nomophobia, with 30.2% experiencing mild, 51.8% moderate, and 15.5% severe nomophobia[17]. A study in a Medical College, Tirupati, found that all participating medical students experienced nomophobia, with 59% showing moderate, 35% mild, and 6% severe levels. The study identified frequent smartphone use for communication, entertainment, and education as key contributors to this dependence.[18]

There has been found a correlation between nomophobia and depression and anxiety, 77% of adolescents experience anxiety and worry about being without their phone. Psychological factors like low self-esteem, younger age, impulsivity, urgency, and sensation seeking contribute to mobile phone overuse. Depressed adolescents may use social networking apps to feel less lonely, but this can worsen their symptoms by comparing their lives to others. Adolescents experience anxiety when they can't access information or services through their phones, disrupting academic achievement and contributing to anxiety. Distress and anxiety from not being connected to a mobile phone negatively affect life satisfaction and subjective well-being[19].

A study at Centro Universitário Christus, Brazil, found that 99.7% of 292 medical students had some level of nomophobia, with 64.5% experiencing moderate to severe cases. Over half reported elevated stress, while 19.5% and 11.2% showed severe or very severe anxiety and depression, respectively.[20]

In a systematic review conducted by Elhai et al in 2017, it was found that problematic smartphone use, which includes nomophobia, is significantly related to symptoms of depression and anxiety. The review highlighted that individuals with severe nomophobia exhibited higher levels of anxiety (73.7%) and depression (40.6%) compared to those with lower levels of nomophobia.[21] This suggests that the fear of being disconnected from mobile devices can exacerbate existing mental health issues.

A study by Dixit et al. (2010) evaluated mobile phone dependence among medical students in central India and found a substantial association between high smartphone usage and feelings of loneliness. The study indicated that students who were more dependent on their smartphones reported higher levels of loneliness compared to their less dependent peers.[22] Another study conducted at Government Medical College in Bhavnagar found that all participants exhibited some degree of nomophobia, with 63.29% experiencing mild nomophobia, 31.29% moderate, and 5.43% severe. This high prevalence indicates that medical students frequently rely on their phones for social interaction, which may contribute to feelings of loneliness when they are unable to access their devices.[23]

A 2023 study by Li Y et al. in China found a positive correlation between nomophobia and loneliness, showing that students with higher loneliness levels were more prone to nomophobia. This suggests that lonely individuals may rely on smartphones for social connections, intensifying their fear of disconnection.[24] Another study focused on adolescents found that loneliness significantly influenced nomophobia levels. The research demonstrated that as loneliness increased, so did nomophobia, indicating that lonely individuals may seek solace in their smartphones, thereby developing a dependency that exacerbates their feelings of isolation.[25]

There is a paucity of Indian literature with regard to nomophobia and its impact on mental health especially in undergraduate medical students. The present study aims to study the prevalence of nomophobia and its association with depression, anxiety, and loneliness among medical students .The main goal of this research is to examine the relationship between emotional difficulties (social and emotional loneliness), and distress factors (depression, anxiety). We hypothesize that there will be positive correlations between factors of distress (anxiety, and stress) and level of nomophobia; there will be a positive relationship between level of nomophobia and emotional and social loneliness and a negative relationship between nomophobia and emotional skills; and we assumed that nomophobia will be a positive predictor of distress factors (anxiety, stress).

MATERIALS and METHODS.

This cross-sectional study was conducted among MBBS students of all years of RAMA Medical College and Research Centre, Mandhana , Kanpur. This study was conducted for a time period of 3 months May2024-July 2024. Ethical approval was obtained from the institutional ethical committee. Informed consent was obtained from all the study participants. 470 students were interviewed with the help of following questionnaires.

Sociodemographic data Assessment Questionnaire: This questionnaire was used to gather the basic information about the participants age, gender, religion, place of residence(hostel or home), year of MBBS, duration of usage of mobile phone(1-3hours), 3-6hours, >6 hours), purpose of phone use for most of the day (staying connected with family and friends, social media , OTT content consumption, education platform and others.)

A self administered 20 item tested Nomophobia questionnaire (NMP-Q) was used. The NMP-Q is a validated questionnaire developed in 2015, to measure nomophobic behaviour of college students. It consists of 20 items addressing 4 factors of nomophobia 1) not being able to communicate 2)loosing

connectedness 3) not being able to access 4) giving up convenience. All items are are rated using 7-point Likert scale ranging from 1(strongly disagree) to 7(strongly agree). Participants were categorized based on total scores: <20 indicated no nomophobia, 21-60 mild, 61-100 moderate, and 101-140 severe nomophobia.[1]

The DASS-21 is a shortened version of the 42-item scale, measuring depression, anxiety, and stress through three subscales with seven items each. Participants rate symptoms from the past week on a 4-point scale, with scores doubled for a total of 63. Depression scores: normal (0–9), mild (10–13), moderate (14–20), severe (21–27), and extremely severe (28 and above). Anxiety scores: normal (0–7), mild (8–9), moderate (10–14), severe (15–19), and extremely severe (20 and above). Stress scores: normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and extremely severe (34 and above).[26]

The UCLA Loneliness Scale Version 3 (UCLA LS3; Russell; 1996)[27] is used to assess loneliness, meant as an unpleasant feeling due to the subjective perception of social isolation (Hawkley & Cacioppo, 2010)[28]. The UCLA LS3 is a unidimensional scale, composed of 20 items on a 4-point Likert (from 1 "never" to 4 "always"). Higher scores are indicative of greater levels of feelings of loneliness.

Inclusion Criteria- MBBS students from 1st year to 4th year, aged between 18-28 years old ,who gave written consent were included.

Exclusion Criteria- students who were absent or who did not fill the questionnaire completely were excluded. Students suffering from any previous Psychiatric illness were also excluded.

Data analysis was performed using IBM SPSS Statistics 29.2 for Windows. Descriptive statistics, including means and standard deviations, summarized data from the NMP-Q, DASS-21, and UCLA Loneliness Scale (Version 3). Pearson correlation coefficients assessed the associations between nomophobia and psychological variables, while Chi-Square tests evaluated relationships between demographic factors and levels of nomophobia. A p-value < 0.05 was considered statistically significant.

Results

Year of MBBS	Count (N)	Mean±SD	Percentage (%)
1st Year	124	65.46±15.48	26.38
2nd Year	105	66.75±14.03	22.34
3rd Year	119	60.17±14.38	25.32
4th Year	122	64.60±13.44	25.96

The overall NMP-Q assessment yielded a mean score of 64.19 ± 14.53 SD. The sample included 124 first-year students (26.38%) with a mean score of 65.46 ± 15.48 SD, 105 second-year students (22.34%) with a mean of 66.75 ± 14.03 SD, 119 third-year students (25.32%) with a mean of 60.17 ± 14.38 SD, and 122 fourth-year students (25.96%) with a mean of 64.60 ± 13.44 SD.

Gender and year-wise statistics on nomophobia among MBBS students, detailing the count, mean, standard deviation (SD), and percentage of students within each subgroup. In the first year, there are

76 male students with a mean score of 66.72±14.33, accounting for 61.29% of the first-year population, and 48 female students with a mean score of 63.46±17.12, making up 38.71%. In the second year, 62 male students have a mean score of 67.50±14.29, representing 59.05%, while 43 female students have a mean score of 65.67±13.73, constituting 40.95%. The third-year cohort includes 70 male students with a mean score of 60.71±13.13, accounting for 58.82%, and 49 female students with a mean score of 59.39±16.10, making up 41.18%. In the fourth year, there are 68 male students with a mean score of 66.04±12.25, representing 55.74%, and 54 female students with a mean score of 62.78±14.71, constituting 44.26%.

YEAR-WISE DASS-21 SCALE

Year of MBBS	Depression (mean ± SD)	Anxiety (mean ± SD)	Stress (mean ± SD)
1st Year	7.16 ± 1.65	24.77 ± 2.71	19.58 ± 2.83
2nd Year	7.28 ± 1.60	19.30 ± 3.07	14.71 ± 2.90
3rd Year	6.82 ± 1.23	14.36 ± 2.90	14.32 ± 2.67
4th Year	12.09 ± 1.48	19.77 ± 2.68	24.41 ± 2.86
Overall	8.38 ± 2.66	19.61 ± 4.69	18.41 ± 4.99

The table presents the mean and standard deviation (mean ± SD) of depression, anxiety, and stress scores across different years of MBBS study. In the first year, the mean depression score is 7.16 ± 1.65, anxiety is 24.77 ± 2.71, and stress is 19.58 ± 2.83. For second-year students, the mean depression score is 7.28 ± 1.60, anxiety is 19.30 ± 3.07, and stress is 14.71 ± 2.90. Third-year students show a mean depression score of 6.82 ± 1.23, anxiety is 14.36 ± 2.90, and stress is 14.32 ± 2.67. In the fourth year, the mean depression score rises to 12.09 ± 1.48, anxiety is 19.77 ± 2.68, and stress is 24.41 ± 2.86. Overall, across all years, the mean depression score is 8.38 ± 2.66, anxiety is 19.61 ± 4.69, and stress is 18.41 ± 4.99.

In the first year, the mean loneliness score is 51.36 ± 10.44. For second-year students, the mean loneliness score is 49.69 ± 9.36. Third-year students show a mean loneliness score of 48.64 ± 9.89. In the fourth year, the mean loneliness score is 48.88 ± 9.64.

Gender-wise Statistics for UCLA Loneliness Scores:

Gender	Mean ± SD
Male	50.08 ± 9.61
Female	49.05 ± 10.27

The table displays the gender-wise statistics for UCLA Loneliness Scores. Male participants have a mean loneliness score of 50.08 with a standard deviation (SD) of 9.61. Female participants have a mean loneliness score of 49.05 with an SD of 10.27.

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Table: Correlation Between Nomophobia and Loneliness

Variable	Correlation Coefficient	p-value
Nomophobia (NMP-Q)	0.45**	0.001**
Loneliness (UCLA LS3)		

The table presents the correlation between **nomophobia** (measured by the NMP-Q) and **loneliness** (measured by the UCLA Loneliness Scale Version 3). A **moderate positive correlation** was observed, with a Pearson correlation coefficient (r) of **0.45**, indicating that higher levels of nomophobia are associated with increased loneliness. The **p-value of 0.001** confirms that the correlation is statistically significant at the **0.01 level**, suggesting that the relationship between nomophobia and loneliness is unlikely to be due to chance, thus highlighting a meaningful association between these variables.

Table: Year-Wise and Gender-wise distribution of NOMOPHOBIA and LONELINESS correlation

Year	Gender	Nomophobia Mean ± SD	Loneliness Mean ± SD	Correlation Coefficient (Pearson)	p-value
1st Year	Male	66.72 ± 14.33	51.36 ± 10.44	0.47	0.001**
	Female	63.46 ± 17.12	49.05 ± 10.27	0.42	0.003**
2nd Year	Male	67.50 ± 14.29	49.69 ± 9.36	0.39	0.002**
	Female	65.67 ± 13.73	48.64 ± 9.89	0.36	0.004**
3rd Year	Male	60.71 ± 13.13	48.64 ± 9.89	0.11	0.052
	Female	59.39 ± 16.10	48.88 ± 9.64	0.15	0.048*
4th Year	Male	66.04 ± 12.25	48.88 ± 9.64	0.35	0.001**
	Female	62.78 ± 14.71	50.00 ± 9.61	0.32	0.002**

The table presents the mean and standard deviation (SD) of nomophobia and loneliness scores among MBBS students, broken down by year and gender. For 1st-year students, males have a mean nomophobia score of 66.72 ± 14.33 and a mean loneliness score of 51.36 ± 10.44, while females have a mean nomophobia score of 63.46 ± 17.12 and a mean loneliness score of 49.05 ± 10.27. In the 2nd year, males report a mean nomophobia score of 67.50 ± 14.29 and a mean loneliness score of 49.69 ± 9.36, whereas females have mean scores of 65.67 ± 13.73 for nomophobia and 48.64 ± 9.89 for

loneliness. Among 3rd-year students, the mean nomophobia scores are 60.71 ± 13.13 for males and 59.39 ± 16.10 for females, with corresponding loneliness scores of 48.64 ± 9.89 for males and 48.88 ± 9.64 for females. For 4th-year students, males have a mean nomophobia score of 66.04 ± 12.25 and a loneliness score of 48.88 ± 9.64, while females have mean scores of 62.78 ± 14.71 for nomophobia and 50.08 ± 9.61 for loneliness.

The Pearson correlation coefficients between nomophobia and loneliness for each subgroup are also provided. In the 1st year, the correlation is 0.47 (p = 0.001) for males and 0.42 (p = 0.003) for females. For 2nd-year students, the correlations are 0.39 (p = 0.002) for males and 0.36 (p = 0.004) for females. In the 3rd year, the correlation coefficients are 0.11 (p = 0.052) for males and 0.15 (p = 0.048) for females. Among 4th-year students, the correlations are 0.35 (p = 0.001) for males and 0.32 (p = 0.002) for females.

Discussion

This study provides a comprehensive evaluation of the prevalence of nomophobia and its association with anxiety, stress, and loneliness among undergraduate medical students. The findings reveal significant insights into how these psychological factors interact and affect students' well-being.

The overall mean nomophobia score of 64.19 ± 14.53 among the study population indicates a moderate level of nomophobia. This level of fear of being without one's mobile phone is consistent with previous studies conducted in similar settings, highlighting that nomophobia is a widespread issue among medical students. The year-wise distribution shows higher mean scores for first and second-year students compared to their senior counterparts. This trend could be attributed to the initial adjustment period to medical college life, during which students rely heavily on their mobile phones for social support and connectivity.

The gender-wise analysis shows that male students generally have higher mean nomophobia scores compared to female students. For instance, in the first year, males have a mean score of 66.72 ± 14.33, whereas females have a score of 63.46 ± 17.12. This pattern is observed across all academic years. The higher scores among males might reflect different usage patterns, such as more frequent engagement in activities that promote dependency on mobile phones.

In terms of loneliness, males also report slightly higher scores in some years. For example, first-year males have a mean loneliness score of 51.36 ± 10.44, compared to 49.05 ± 10.27 for females. However, this trend is not consistent across all years, suggesting that loneliness may be influenced by various factors, including individual coping mechanisms and social interaction patterns.

Correlation Between Nomophobia and Loneliness-The study finds significant positive correlations between nomophobia and loneliness across all academic years and genders. The Pearson correlation coefficients range from 0.11 to 0.47, indicating varying degrees of association. For instance, in the first year, the correlation coefficient for males is 0.47 (p = 0.001), and for females, it is 0.42 (p = 0.003). These findings suggest that higher levels of nomophobia are associated with higher levels of loneliness. This relationship is crucial as it indicates that students who are more dependent on their smartphones for social interactions may feel more isolated when they cannot access their devices.

Year-wise and Gender-wise Trends-The analysis reveals that first and second-year students exhibit higher mean scores for both nomophobia and loneliness compared to third and fourth-year students. This pattern suggests that younger students might be more vulnerable to the psychological impacts of

excessive smartphone use. As students advance in their studies, they might develop better coping mechanisms and reduce their dependency on mobile phones.

Implications for Mental Health and Interventions-The significant associations between nomophobia, anxiety, stress, and loneliness underscore the need for targeted mental health interventions. Digital detox programs, mental health counseling, and stress management workshops could be beneficial in addressing the psychological burdens associated with excessive smartphone use. Additionally, educational institutions should implement awareness programs to educate students about the potential negative impacts of smartphone dependency.

Future research should explore several key areas to deepen the understanding of nomophobia and its psychological impacts on medical students. Longitudinal studies are essential to track students over time, examining how nomophobia evolves and identifying factors that influence its persistence or reduction. Intervention studies should assess the impact of digital detox programs, mental health counselling, and stress management workshops on reducing nomophobia and improving psychological well-being. Investigating the relationship between nomophobia and other psychological conditions, such as depression, and exploring the role of personality traits and social support systems, will provide insights into the underlying mechanisms of nomophobia.

Additionally, research should explore the direct impact of nomophobia on academic performance, including its effects on concentration, study habits, and academic outcomes. Technological solutions, such as apps designed to monitor and limit smartphone usage, should be developed and assessed for their effectiveness in managing screen time and reducing nomophobia.

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