*Original Article*

# Nomophobia among Medical Students in Karachi: A Cross-Sectional Analysis of Prevalence, Sleep Quality, Anxiety, and Academic Performance

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Erum Tanveer[1], Vinod Kumar[1], Syeda Amna[1], Hamza Ahmed[1]

[1] *United College of Physical Therapy, Karachi, Pakistan*

## ABSTRACT

**Background:** Nomophobia (no mobile phone phobia) represents an emerging psychological phenomenon characterized by anxiety when separated from mobile devices. Medical students, as heavy technology users, may be particularly vulnerable to this condition. To assess nomophobia prevalence among undergraduate medical students in Karachi and examine its correlations with sleep quality, anxiety levels, and academic performance.

**Methods:** This cross-sectional study surveyed 270 undergraduate medical students from three teaching hospitals in Karachi between August-September 2023. Data collection utilized validated instruments: the Nomophobia Questionnaire (NMP-Q), Insomnia Severity Index (ISI), and Generalized Anxiety Disorder-7 (GAD-7) scale. Statistical analysis employed descriptive statistics and Pearson correlation coefficients.

**Results:** Nomophobia prevalence reached 99.6% (n=268), with 56.7% experiencing moderate and 34.4% severe symptoms (mean NMP-Q score: 89.42±22.965). Significant positive correlations emerged between nomophobia and anxiety ($r=1.0$, $p<0.001$) and insomnia ($r=1.0$, $p=0.012$). No significant association was found with academic performance ($p=0.142$). Female participants demonstrated higher anxiety levels than males.

**Conclusion:** The exceptionally high nomophobia prevalence among medical students, coupled with strong associations with sleep disturbances and anxiety, necessitates urgent intervention strategies. Educational institutions should implement digital wellness programs and establish guidelines for healthy smartphone usage.

**Keywords:** *Academic Performance, Medical Students, Nomophobia, Smartphone Addiction.*

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**Corresponding Email:** erum.tanveer@ucpt.edu.pk

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## INTRODUCTION

The ubiquity of smartphones has fundamentally transformed modern communication, education, and social interaction. While these devices offer unprecedented connectivity and access to information, their excessive use has given rise to a new psychological phenomenon: nomophobia, defined as the fear or anxiety experienced when unable to access one's mobile phone or its features.

First conceptualized in 2008, nomophobia—derived from "no mobile phone phobia"—has emerged as a significant concern in mental health research.1 This condition manifests through various symptoms including persistent checking behaviors, anxiety when battery levels are low, distress when cellular signals are unavailable, and fear of being unreachable. The phenomenon has become increasingly prevalent among young adults, particularly those in academic settings who rely heavily on digital devices for educational and social purposes.

Medical students represent a unique population at heightened risk for nomophobia due to their intensive academic demands, need for constant information access, and social connectivity requirements.2 Generation Z students, born between the mid-1990s and mid-2000s, are considered the first true digital natives, having transitioned seamlessly from conventional computers to mobile devices during their formative years. This demographic's relationship with technology differs fundamentally from previous

generations, potentially increasing their vulnerability to smartphone-related psychological disorders.

Research investigating nomophobia prevalence has revealed concerning trends across various populations. Studies conducted in India found that 73% of university students exhibited nomophobia symptoms, with 83% experiencing panic attacks and 21% reporting phantom ringing syndrome when separated from their devices.3 These findings align with broader international research demonstrating the global nature of this emerging psychological concern.4

The implications of nomophobia extend beyond mere inconvenience, potentially affecting multiple domains of functioning. Excessive smartphone dependence has been linked to various physical and psychological consequences, including musculoskeletal disorders, sleep disturbances, anxiety, depression, and impaired social functioning.5 For medical students, who must maintain high academic standards while managing significant stress, understanding the relationship between nomophobia and key variables such as sleep quality, anxiety levels, and academic performance becomes critically important.

The relationship between nomophobia and sleep disturbances has been extensively documented, with systematic reviews demonstrating strong correlations between smartphone dependence and sleep pattern disruptions.6 Similarly, connections between nomophobia and anxiety disorders have been established, though the mechanisms underlying these relationships require further investigation.7 Less clear, however, is the impact of nomophobia on academic performance, with existing research providing mixed results.8

Given the limited research on nomophobia among medical students in Pakistan, this study aims to fill a crucial gap in the literature by examining the prevalence of nomophobia in this population and its associations with sleep quality, anxiety, and academic achievement. Understanding these relationships is essential for developing targeted interventions and support systems for medical students, who face unique academic and professional pressures that may exacerbate smartphone-related psychological distress.

## METHODOLOGY

### *Study Design and Setting*

This cross-sectional study was conducted among undergraduate medical students from three teaching hospitals in Karachi. The study protocol received approval from the respective institutional authorities prior to data collection.

### *Participants and Sampling*

The study employed convenience sampling to recruit participants between August and September 2023. Inclusion criteria comprised students aged 18-26 years enrolled in MBBS, Doctor of Physical Therapy (DPT), and Doctor of Pharmacy (D.Pharm) programs. Students from other disciplines or outside the specified age range were excluded.

Sample size calculation determined a requirement of 270 participants to achieve adequate statistical power. The final sample included 270 students: 51 males (18.9%) and 219 females (81.1%), representing 38 MBBS students (14.1%), 198 DPT students (73.3%), and 34 pharmacy students (12.6%).

### *Data Collection Instruments*

Data collection utilized a comprehensive four-part questionnaire administered in person:

- **Part 1:** Demographics - Age, gender, academic program, year of study, and grade point average (GPA) for academic performance correlation.
- **Part 2:** Nomophobia Questionnaire (NMP-Q) - A validated 20-item instrument measuring fear of being without mobile phone access.9 Items are rated on a 7-point Likert scale (1=strongly disagree to 7=strongly agree), with total scores ranging from 20-140. Scoring interpretation: ≤20 (no nomophobia), 21-59 (mild), 60-99 (moderate), 100-140 (severe). The instrument demonstrates excellent reliability (Cronbach's α=0.9).
- **Part 3:** Insomnia Severity Index (ISI) - A 7-item scale assessing insomnia symptoms over the past two weeks.10 Items are rated from 0 (not at all) to 4 (very severe), with total scores ranging from 0-28. Higher scores indicate more severe insomnia. The scale shows good reliability (Cronbach's α=0.8).

- **Part 4:** Generalized Anxiety Disorder-7 (GAD-7) - A 7-item screening tool for generalized anxiety disorder symptoms over the past two weeks.11 Total scores range from 0-21, with higher scores indicating greater anxiety severity. The instrument demonstrates excellent reliability (Cronbach's α=0.8).

### *Statistical Analysis*

Data analysis was conducted using SPSS version 25.0. Descriptive statistics included frequencies and percentages for categorical variables and means with standard deviations for continuous variables. Pearson correlation coefficients assessed relationships between nomophobia scores and sleep quality, anxiety levels, and academic performance. Statistical significance was set at $p<0.05$.

### Ethical Considerations

All participants provided informed consent after receiving information about the study purpose, procedures, and confidentiality measures. Participation was voluntary, and participants could withdraw at any time without consequence.

## RESULTS

### *Participant Characteristics*

The study enrolled 270 undergraduate medical students with a mean age of 21.3±2.1 years. The sample was predominantly female (81.1%, n=219), with males comprising 18.9% (n=51). Academic program distribution showed DPT students as the largest group (73.3%, n=198), followed by MBBS (14.1%, n=38) and pharmacy students (12.6%, n=34).

### *Nomophobia Prevalence and Severity*

The overall prevalence of nomophobia among participants was exceptionally high at 99.6% (n=268). Only two students (0.7%) showed no signs of nomophobia, while 21 (7.8%) exhibited mild symptoms. The majority demonstrated moderate nomophobia (56.7%, n=153), with a substantial proportion showing severe symptoms (34.4%, n=93).

The mean NMP-Q score was 89.42±22.965, indicating an overall moderate level of nomophobia across the sample. This score distribution suggests that the vast majority of medical students experience clinically significant levels of mobile phone separation anxiety.

**Table-1: Distribution of Nomophobia Severity Levels**

| Severity Level | Frequency (n) | Percentage (%) |
|---|---|---|
| Absent | 2 | 0.7 |
| Mild | 21 | 7.8 |
| Moderate | 153 | 56.7 |
| Severe | 93 | 34.4 |
| Total | 270 | 100.0 |

### *Anxiety Levels*

The mean GAD-7 anxiety score was 6.98±5.501, indicating mild anxiety levels across the sample. Gender differences were notable, with males predominantly showing minimal anxiety while females exhibited mild anxiety levels. Analysis by academic program revealed varying anxiety distributions, with MBBS students showing the highest proportion of minimal anxiety (55.3%), while pharmacy students demonstrated the highest rate of mild anxiety (47.1%).

**Table-2: Anxiety Severity by Academic Program**

| Program | Minimal n (%) | Mild n (%) | Moderate n (%) | Severe n (%) |
|---|---|---|---|---|
| **MBBS** | 21 (55.3) | 10 (26.3) | 2 (5.3) | 5 (13.2) |
| **DPT** | 74 (37.4) | 65 (32.8) | 37 (18.7) | 22 (11.1) |
| **D.Pharm** | 12 (35.3) | 16 (47.1) | 2 (5.9) | 4 (11.8) |

### *Sleep Quality Assessment*

The mean ISI score was 10.21±5.481, indicating subthreshold insomnia across the sample. The majority of participants experienced subthreshold insomnia (41.9%, n=113), while 35.9% (n=97) showed no clinically significant insomnia. Age showed no significant correlation with insomnia severity ($p=0.93$), suggesting that sleep disturbances related to nomophobia are consistent across the age range studied.

### *Correlation Analysis*

Strong positive correlations were identified between nomophobia and both anxiety ($r=1.0$, $p<0.001$) and insomnia ($r=1.0$, $p=0.012$). These findings indicate that higher levels of nomophobia are associated with increased anxiety symptoms and more severe sleep disturbances. Contrary to expectations, no significant relationship was observed between nomophobia scores and academic performance as measured by GPA ($p=0.142$).

This suggests that despite the psychological distress associated with nomophobia, students' academic achievement remains largely unaffected, possibly due to compensatory mechanisms or the integral role of smartphones in academic activities.

**Table-3: Correlation Matrix of Study Variables**

| Variables | Nomophobia | Anxiety | Insomnia | Academic Performance |
|---|---|---|---|---|
| **Nomophobia** | 1.000 | 1.000*** | 1.000* | -0.095 |
| **Anxiety** | 1.000*** | 1.000 | 0.847*** | -0.128 |
| **Insomnia** | 1.000* | 0.847*** | 1.000 | -0.076 |
| **Academic Performance** | -0.095 | -0.128 | -0.076 | 1.000 |

*p<0.05, ***p<0.001

## DISCUSSION

This study reveals an alarming prevalence of nomophobia among medical students in Karachi, with 99.6% of participants experiencing some degree of mobile phone separation anxiety. This finding exceeds many international studies and highlights the severity of smartphone dependence in this population.[12] The predominance of moderate to severe symptoms (91.1% combined) underscores the clinical significance of this phenomenon among medical students.

The perfect correlation between nomophobia and anxiety (r=1.0) observed in this study supports existing literature linking smartphone dependence with psychological distress.[13] This relationship may be bidirectional, where nomophobia contributes to anxiety while anxiety-prone individuals may be more susceptible to developing nomophobia. The finding that female participants showed higher anxiety levels aligns with broader research on gender differences in anxiety disorders and smartphone usage patterns.[14]

The strong correlation between nomophobia and sleep disturbances confirms previous research demonstrating the impact of excessive smartphone use on sleep quality.[15] The mechanisms underlying this relationship likely include blue light exposure affecting circadian rhythms, bedtime smartphone use disrupting sleep hygiene, and anxiety about phone accessibility interfering with sleep initiation and maintenance.

The absence of a significant relationship between nomophobia and academic performance presents an interesting paradox. While nomophobia is associated with increased anxiety and sleep disturbances—both factors typically linked to poor academic outcomes—GPA remains unaffected. This finding may reflect several factors:

1. **Compensatory smartphone use**: Students may use their devices extensively for academic purposes, potentially offsetting negative effects through educational benefits.
2. **Adaptive strategies**: Medical students may develop coping mechanisms that allow them to maintain academic performance despite psychological distress.
3. **Limited GPA sensitivity**: GPA may not capture subtle changes in learning efficiency, creativity, or long-term knowledge retention.

The high prevalence of nomophobia among medical students has significant implications for medical education and student wellness programs. Medical training already involves substantial stress, and the additional burden of nomophobia-related anxiety and sleep disturbances could contribute to burnout and mental health problems that emerge later in training or practice. Educational institutions should consider implementing digital wellness curricula that address healthy smartphone usage, stress management techniques, and sleep hygiene practices. Additionally, policies regarding smartphone use in clinical and classroom settings should balance educational benefits with the need to reduce dependence.

Our findings align with recent international research showing high nomophobia prevalence among university students. A study in Oman reported 99.3% prevalence with predominantly moderate severity, closely matching our results.[16] Similarly, research in Bangladesh found comparable severity distributions (9.4% mild, 56.1% moderate, 34.5% severe), supporting the global nature of this phenomenon.[17] The consistency of these findings across different cultural contexts suggests that nomophobia represents a universal response to smartphone integration in modern life, transcending cultural and geographic boundaries.[18]

The strong associations between nomophobia, anxiety, and sleep disturbances identified in this study have important clinical implications.[19] Healthcare providers should consider screening for nomophobia when evaluating young adults presenting with anxiety or sleep disorders. Early identification could facilitate targeted interventions and prevent escalation of symptoms.

From a public health perspective, the high prevalence of nomophobia among future healthcare providers raises concerns about professional well-being and patient care quality.[20] Medical students experiencing significant smartphone-related anxiety may carry these patterns into their professional practice, potentially affecting their ability to focus during patient encounters or maintain appropriate professional boundaries with technology.

***Limitations and Future Directions***

Several limitations should be acknowledged in interpreting these results. The convenience sampling method may introduce selection bias, and the cross-sectional design prevents establishment of causal relationships. The study's focus on three teaching hospitals in Karachi limits generalizability to other populations or geographic regions. The findings support the need for comprehensive digital wellness programs integrated into medical education curricula and broader public health initiatives addressing smartphone-related mental health concerns.

The perfect correlations observed between nomophobia and both anxiety and insomnia (r=1.0) are statistically unusual and may suggest measurement overlap or methodological issues that warrant further investigation. Future studies should employ longitudinal designs to examine causal relationships and include broader samples representing diverse populations. Additional research should explore interventional strategies for reducing nomophobia and its associated symptoms. Randomized controlled trials of digital wellness programs, mindfulness-based interventions, and cognitive-behavioral therapy approaches could provide evidence for effective treatment strategies.

As future healthcare providers, medical students' relationship with technology will influence not only their personal well-being but also their professional effectiveness and patient care quality.[24] Addressing nomophobia through evidence-based interventions and preventive strategies represents a critical investment in both individual student welfare and the future of healthcare delivery.

The universality of nomophobia symptoms observed in this study suggests that this phenomenon should be considered a significant public health concern requiring immediate attention and resource allocation.[25] Educational institutions, mental health professionals, and technology companies must collaborate to develop solutions that harness the benefits of smartphone technology while mitigating its potential for psychological harm.

## CONCLUSION

This study demonstrates an exceptionally high prevalence of nomophobia among medical students in Karachi, with nearly universal presence of symptoms and a concerning proportion experiencing moderate to severe impairment. The strong associations with anxiety and sleep disturbances highlight the significant mental health implications of excessive smartphone dependence in this population.

While academic performance appears unaffected in the short term, the psychological burden associated with nomophobia warrants serious attention from educational institutions, healthcare providers, and policymakers. The findings support the need for comprehensive digital wellness programs integrated into medical education curricula and broader public health initiatives

addressing smartphone-related mental health concerns.

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### Author Contributions
**Erum Tanveer** was responsible for the conceptualization of the study, conducting the literature review, and final editing of the manuscript. **Vinod Kumar** handled data collection and contributed to writing the initial draft. **Syeda Amna** performed the data analysis and interpreted the results. **Hamza Ahmed** designed the questionnaire and formatted the final manuscript.

### Ethical Approval
This study received approval from the Ethical Review Committee of United College of Physical Therapy (Reference no. UCPT/Ethics/2023/07/05).

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None.

### Conflict of Interests
None.

## REFERENCES
1. Yildirim C, Correia AP. Exploring the dimensions of nomophobia: development and validation of a self-reported questionnaire. Comput Hum Behav. 2015;49:130-7.
**DOI:** https://doi.org/10.1016/j.chb.2015.02.059
2. Bhattacharya S, Bashar MA, Srivastava A, Singh A. Nomophobia: no mobile phone phobia. J Family Med Prim Care. 2019;8(4):1297-300.
**DOI:** https://doi.org/10.4103/jfmpc.jfmpc_71_19
3. Notara V, Vagka E, Gnardellis C, Lagiou A. The emerging phenomenon of nomophobia in young adults: a systematic review study. Addict Health. 2021;13(2):120-36.
**DOI:** https://doi.org/10.22122/ahj.v13i2.309
4. León-Mejía AC, Gutiérrez-Ortega M, Serrano-Pintado I, González-Cabrera J. A systematic review on nomophobia prevalence: surfacing results and standard guidelines for future research. PLoS One. 2021;16(5):e0250509.
**DOI:** https://doi.org/10.1371/journal.pone.0250509
5. Bragazzi NL, Del Puente G. A proposal for including nomophobia in the new DSM-V. Psychol Res Behav Manag. 2014;7:155-60.
**DOI:** https://doi.org/10.2147/PRBM.S41386
6. Jahrami H, Abdelaziz A, Binsanad L, Alhaj OA, Buheji M, Bragazzi NL, et al. The association between symptoms of nomophobia, insomnia and food addiction among young adults: findings of an exploratory cross-sectional survey. Int J Environ Res Public Health. 2021;18(2):711.
**DOI:** https://doi.org/10.3390/ijerph18020711
7. Daraj LR, AlGhareeb M, Almutawa YM, Trabelsi K, Jahrami H. Systematic review and meta-analysis of the correlation coefficients between nomophobia and anxiety, smartphone addiction, and insomnia symptoms. Healthcare (Basel). 2023;11(14):2066.
**DOI:** https://doi.org/10.3390/healthcare11142066
8. Qutishat M, Lazarus ER, Razmy AM, Packianathan S. University students' nomophobia prevalence, sociodemographic factors and relationship with academic performance at a university in Oman. Int J Africa Nurs Sci. 2020;13:100250.
**DOI:** https://doi.org/10.1016/j.ijans.2020.100206
9. Sohn SY, Rees P, Wildridge B, Kalk NJ, Carter B. Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people: a systematic review, meta-analysis and GRADE of the evidence. BMC Psychiatry. 2019;19:356.
**DOI:** https://doi.org/10.1186/s12888-019-2350-x
10. Morin CM, Belleville G, Bélanger L, Ivers H. The insomnia severity index: psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep. 2011;34(5):601-8.
**DOI:** https://doi.org/10.1093/sleep/34.5.601
11. Löwe B, Decker O, Müller S, Brähler E, Schellberg D, Herzog W, et al. Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. Med Care. 2008;46(3):266-74.
**DOI:** https://doi.org/10.1097/MLR.0b013e318160d093
12. Jahrami H, Trabelsi K, Boukhris O, Hussain JH, Alenezi AF, Humood A, et al. The prevalence of mild, moderate, and severe nomophobia symptoms: a systematic review, meta-analysis, and meta-regression. Behav Sci (Basel). 2022;13(1):35.
**DOI:** https://doi.org/10.3390/bs13010035
13. Lin CY, Potenza MN, Ulander M, Broström A, Ohayon MM, Chattu VK, et al. Longitudinal relationships between nomophobia, addictive use of social media, and insomnia in adolescents. Healthcare (Basel). 2021;9(9):1201.
**DOI:** https://doi.org/10.3390/healthcare9091201
14. Tangmunkongvorakul A, Musumari PM, Thongpibul K, Srithanaviboonchai K, Techasrivichien T, Suguimoto SP, et al. Association of excessive smartphone use with psychological well-being among university students in Chiang Mai, Thailand. PLoS One. 2019;14(1):e0210294.
**DOI:** https://doi.org/10.1371/journal.pone.0210294
15. Kaur A, Ani A, Sharma A, Kumari V. Nomophobia and social interaction anxiety among university students. Int J Africa Nurs Sci. 2021;15:100356.
**DOI:** https://doi.org/10.1016/j.ijans.2021.100352
16. Vagka E, Gnardellis C, Lagiou A, Notara V. Prevalence and factors related to nomophobia: arising issues among young adults. European Journal of Investigation in Health, Psychology and Education. 2023;13(8):1467-76.
**DOI:** https://doi.org/10.3390/ejihpe13080107
17. Al-Mamun F, Mamun MA, Prodhan MS, Muktarul M, Griffiths MD, Muhit M, et al. Nomophobia among university students: prevalence, correlates, and the mediating role of smartphone use between Facebook addiction and nomophobia. Heliyon. 2023;9(3):e14284.
**DOI:** https://doi.org/10.1016/j.heliyon.2023.e14284
18. González-Cabrera J, León-Mejía A, Pérez-Sancho C, Calvete E. Adaptation of the nomophobia questionnaire (NMP-Q) to Spanish in a sample of adolescents. Actas Esp Psiquiatr. 2017;45(4):137-44.
19. Gnardellis C, Vagka E, Lagiou A, Notara V. Nomophobia and its association with depression, anxiety and stress (DASS scale), among young adults in Greece. Healthcare (Basel). 2023;11(24):3146.
**DOI:** https://doi.org/10.3390/ejihpe13120191
20. Sethia S, Melwani V, Melwani S, Priya A, Gupta M, Khan A. A study to assess the degree of nomophobia among the undergraduate students of a medical college in Bhopal. Int J Community Med Public Health. 2018;5(6):2442-5.
**DOI:** https://doi.org/10.18203/2394-6040.ijcmph20182174

21. Gao T, Li J, Zhang H, Gao J, Kong Y, Hu Y, et al. The influence of alexithymia on mobile phone addiction: the role of depression, anxiety and stress. J Affect Disord. 2018;225:761-6.
**DOI:** https://doi.org/10.1016/j.jad.2017.08.020
22. Farchakh Y, Hallit R, Akel M, Chalhoub C, Hachem M, Hallit S, et al. Nomophobia in Lebanon: scale validation and association with psychological aspects. PLoS One. 2021;16(4):e0249890.
**DOI:** https://doi.org/10.1371/journal.pone.0249890
23. King AL, Valença AM, Silva AC, Baczynski T, Carvalho MR, Nardi AE. Nomophobia: dependency on virtual environments or social phobia? Comput Human Behav. 2013;29(1):140-4.
**DOI:** https://doi.org/10.1016/j.chb.2012.07.025
24. Jahrami H. The relationship between nomophobia, insomnia, chronotype, phone in proximity, screen time, and sleep duration in adults: a mobile phone app-assisted cross-sectional study. Healthcare (Basel). 2023;11(10):1503.
**DOI:** https://doi.org/10.3390/healthcare11101503
25. AlMarzooqi MA, Alhaj OA, Alrasheed MM, Helmy M, Trabelsi K, Ebrahim A, et al. Symptoms of nomophobia, psychological aspects, insomnia and physical activity: a cross-sectional study of esports players in Saudi Arabia. Healthcare (Basel). 2022;10(2):257.
**DOI:** https://doi.org/10.3390/healthcare10020257