

Prevalence of Nomophobia and Its Association with Academic Performance Among Physiotherapy Students in Saudi Arabia: A Cross-Sectional Survey

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Background: Nomophobia is common among students in many healthcare disciplines, and its association with academic performance has been explored before. However, there is no available data on its prevalence and association with academic performance among undergraduate physiotherapy (PT) students in Saudi Arabia.

Methods: Between 22 December 2022 and 30 January 2023, a cross-sectional survey was conducted by dissemination using an online platform (Survey Monkey).

Results: In total, 806 PT students, with males accounting for 494 (61%), responded to the survey. The prevalence of nomophobia among PT students was 98.4% (793). The mean (\pm SD) of the total NMP-Q items scores was 49 (\pm 17), indicating a mild level of nomophobia. Female PT students had significantly higher nomophobia scores than the males (47 (39–65); 44 (38–52); ($p < 0.001$)). Non-smokers had significantly higher nomophobia scores than smokers (46 (38–61); 44 (38–49); ($p = 0.004$)). Regarding grade point averages (GPA), the students with a GPA of less than 3.49 had the highest nomophobia score (51 (43–74); $p < 0.001$)). Concerning the stage of their studies, bridging students had the highest nomophobia score (51 (34–76); $p = 0.023$)). Regarding academic warnings, those who reported no academic warnings had the highest nomophobia score (46 (42–50); $p = 0.023$)). Finally, regarding study hours, the students who spent \geq five hours studying per week had the highest nomophobia score (54 (42–68); $p < 0.001$)).

Conclusion: Nomophobia is common among PT students, with the majority experiencing a mild level. Being female, non-smoker, and having a higher academic performance were risk factors associated with higher nomophobia levels.

Keywords: nomophobia, physiotherapy, PT, Saudi Arabia

Introduction

Technology plays an essential role in modern life, and what enhances our immersion in it increasingly are smartphones. They have become indispensable because they are the quickest means of communication and the easiest way to access the internet and obtain information. Just as phones have indispensable benefits aimed at human comfort, their overuse has

recently shown us psychological and physical consequences that ultimately lead to changes in various aspects of life. Recently, the harm caused by technology has attracted the attention of many researchers around the world, looking into problems such as impaired concentration,¹ weight disorders,² impaired cognitive function,³ dizziness,⁴ and nomophobia.⁵

Nomophobia is a psychological disorder in which a person experiences unjustified anxiety and fear if he/she cannot use his/her phone for a while, and this fear is followed by a feeling of frustration, anticipation and obsessive thoughts.¹ Nomophobia is disorder of this century due to its negative impact on adolescents. Several signs and symptoms may accompany nomophobia including anxiety, respiratory alterations, trembling, perspiration, agitation, disorientation, and tachycardia.⁶ It is quite widespread among adults and adolescents in Saudi Arabia^{7,8} Several studies have shown that nomophobia is common among students of the healthcare disciplines, and its prevalence were ranging between 83% and 85% among medical,⁹⁻¹¹ 75% among pharmacy,¹² 97% among respiratory therapy students¹³ and 88% among nursing students,¹⁴ especially during clinical training. Despite the benefits of using the phone in the clinical setting for the availability of references and professional guidelines and the ease of searching for and obtaining information, the overuse of smartphones may distract students during their clinical training, leading to mental distraction, difficulty in concentrating, attention deficit, poor quality of patients' care and a lack of ability to remember clinical information.¹⁵ Excessive use of smartphones may lead to nomophobia, especially as students' progress with their academic levels and during clinical training. Nomophobia is usually assessed by questionnaires, such as the NMP-Q questionnaire.¹⁶

As it has previously been reported, several studies reported the prevalence of nomophobia among students and its association with academic performance. Lepp et al reported a relationship between low grade point average and higher cell phone usage among college students in the United States.¹⁷ Additionally, it has been reported that higher academic performance was associated with higher nomophobia scores.^{13,18} However, no previous study has been conducted and has reported on the prevalence of nomophobia among physiotherapy students, and the extent of its association with academic performance in Saudi Arabia. Therefore, this study aims to determine the prevalence of nomophobia and assess its association with academic performance of physiotherapy students in Saudi Arabia. Moreover, the relationship between nomophobia and sociodemographic elements, such as gender, smoking status and living arrangements, will be examined.

Methods

Study Design

Between 22 December 2022 and 30 January 2023, a cross-sectional survey was conducted and disseminated using an online platform (Survey Monkey).

Questionnaire

A questionnaire comprising 32 multiple-choice closed questions was formulated and developed to achieve the study aims. The questionnaire consisted of two sections; the first section contained 12 multiple-choice closed questions related to gender, age, geographical location, marital and smoking status, living arrangements, university sector, cumulative GPA, academic year, number of absent days during last semester, academic warnings, and the number of hours spent studying per week. The second section consisted of the nomophobia questionnaire (NMP-Q). It involved 20 statements that had been formulated and validated by Yildirim and Correia.¹⁶ The NMP-Q included four main domains: the "not being able to access information" domain, which comprised four statements; the "giving up convenience" domain, which comprised five statements; the "not being able to communicate" domain, which comprised six statements, and the "losing connectedness" domain, which comprised five statements. The questionnaire employed a seven-point Likert scale where 1 was "strongly disagree" and 7 was "strongly agree". The NMP-Q offers a score ranging from 20 to 140, where a higher score corresponds to a higher severity of nomophobia.¹⁹ A score of 20 represents the absence of nomophobia; a score between 21 and 59 represents mild nomophobia; a score between 60 and 99 indicates moderate nomophobia, and a score between 100 and 140 represents severe nomophobia. This study used the Cronbach alpha reliability test, which was 0.95, indicating that the NMP-Q had excellent internal consistency. Additionally, the questionnaire was sent to 10 PT students, not included in the total sample, as well as with study aims for their feedback.

The purpose of the study, confidentiality statements and the contact details of the lead investigator in case any questions arose were provided to the participants before they started to answer the questionnaire. Additionally, voluntary participation was ensured by asking if the participants were happy to complete the survey or not. An additional statement was provided in the survey:

By answering 'yes' to completing the survey questionnaire, you voluntarily agree to participate in this study and give your consent to use your anonymous data for research purposes.

Three to five minutes was assumed to be the time required to complete the survey.

Sampling Strategy

This study utilized a convenience sampling technique to approach all governmental and private PT programs across the Kingdom of Saudi Arabia. Additionally, the survey link was sent to several faculty members of PT programs across the Kingdom of Saudi Arabia to disseminate the survey to their undergraduate PT students.

Sample Size

Based on the WHO recommendations for the minimal sample size needed for a prevalence study,²⁰ using 95% confidence interval, a standard deviation of 0.5, and a margin of error of 5%. The required sample size was 385 participants.

Ethical Approval

The Institutional Review Board of King Abdulaziz University approved the study, reference number (435–22).

Statistical Analysis

Data were collected and analyzed using the Statistical Package for Social Sciences (SPSS software, Version 28). The normality of distributions of quantitative variables was tested using the Kolmogorov–Smirnov test and histogram. As the variables were not normally distributed, the Mann–Whitney *U*-test and the Kruskal–Wallis test were used to examine the differences between the median nomophobia scores among participants from different demographic groups. The categorical variables were reported and presented in percentages and frequencies. Statistical significance was considered if the $p < 0.05$ with a 95% confidence interval.

Results

A total of 806 PT students took part in this survey. The majority of the participants were male, accounting for 494 (61%) of the total responses. The mean standard deviation of the participants' age was ($M \pm SD$ 21 \pm 1) years old, with the majority, 692 (86%), being single. The respondents came from various regions of the Kingdom of Saudi Arabia: 286 (35%) were from the Southern Region, 203 (25%) were from the Western Region, 166 (21%) were from the Central Region, 136 (17%) were from the Eastern Region and 15 (2%) were from the Northern Region. The majority of respondents were non-smokers 616 (77%), living with their families 591 (73%), with a majority, 804 (99%), enrolled in public universities. More than half of the respondents, 497 (61.7%), reported a cumulative GPA of 3.50–4.49, while 276 (34.2%) spent more than five hours a week studying. The majority, 589 (73.1%), reported that they had not received any academic warnings.

Full details of the sociodemographic data are presented in [Table 1](#).

The Prevalence of Nomophobia Among Physiotherapy Students

The survey data revealed a prevalence of nomophobia (98.4%) among the total respondents. The mean standard deviation of the total scores of the NMP-Q questionnaire was 49 (± 17), indicating a mild level of nomophobia. The data from this questionnaire also revealed that more than half of the respondents, 603 (74.8%), had a mild level of nomophobia, while 183 (22.7%) of the respondents had a moderate level of nomophobia. Only seven (0.9%) of the respondents reported a severe nomophobia level, while 13 (1.6%) had an absence of nomophobia ([Table 2](#)). The median and interquartile ranges (IQR) of each nomophobia subscale are reported in [Table 3](#).

Table I Demographic Data of Physiotherapy Students (N= 806)

Demographics	Frequency (%), M \pm SD
Gender n (%)	
Male	494 (61%)
Female	312 (39%)
Age (mean, \pm SD)	21 \pm 1
Geographic Location n (%)	
Southern region	284 (35%)
Western region	203 (25%)
Central region	166 (21%)
Eastern region	138 (17%)
Northern region	15 (2%)
University name	
Jazan University	255 (32%)
King Saud University	151 (19%)
Imam Abdulrahman Bin Faisal University	124 (15%)
Taibah University	123 (15%)
King Abdulaziz University	82 (10%)
King Khalid University	44 (5%)
King Saud bin Abdulaziz university for Health Sciences	10 (1%)
Tabuk University	5 (0.6%)
University of Bisha	5 (0.6%)
Batterjee Medical College	3 (0.4%)
Almaarefa University	1 (0.1%)
Prince Nourah Bint Abdul Rahman University	1 (0.1%)
Prince Sultan Military College for Health Sciences	1 (0.1%)
Umm Al Qura University	1 (0.1%)
Marital Status n (%)	
Single	692 (86%)
Married	114 (14%)
Smoking Status n (%)	
Non-smoker	617 (77%)
Ex-smoker	114 (14%)
Current smoker	75 (9%)
Living arrangement n (%)	
Living with family	589 (73%)
Not living with family	217 (27%)
University sector n (%)	
Governmental	804 (99%)
Private	2 (1%)
Cumulative GPA n (%)	
4.50–5.00	239 (29.7%)
3.50–4.49	497 (61.7%)
< 3.49	70 (8.7%)
Academic level n (%)	
First year	113 (14.0%)
Second year	190 (23.6%)
Third year	233 (28.9%)

(Continued)

Table 1 (Continued).

Demographics	Frequency (%), M \pm SD
Fourth year	239 (29.7%)
Intern	26 (3.2%)
Bridging	5 (0.6%)
Absences during last semester n (%)	
No absence	356 (44.2%)
1–2 days	338 (41.9%)
3–4 days	85 (10.5%)
\geq 5 days	27 (3.4%)
Academic warnings n (%)	
No warning	589 (73.1%)
1 warning	171 (21.2%)
\geq 2 warnings	46 (5.7%)
Hours of studying per week n (%)	
< 1 hr.	88 (10.9%)
1–2 hrs.	199 (24.7%)
3–4 hrs.	243 (30.1%)
\geq 5 hrs.	276 (34.2%)

Note: Data are presented as frequency and percentage or mean (standard deviation (SD)).

Abbreviation: GPA, Grade Point Average.

Table 2 Prevalence of Nomophobia Among Physiotherapy Students (N= 806)

Level of Nomophobia	Frequency (%)
Absence (\leq 20)	13 (1.6%)
Mild (21–59)	603 (74.8%)
Moderate (60–99)	183 (22.7%)
Severe (\geq 100)	7 (0.9%)

Note: Data are presented as frequency and percentage.

Table 3 Physiotherapy Students' Scores for Each NMP-Q Subscale (N= 806)

Nomophobia Subscales	Median (IQR)
1: Not being able to communicate	9 (8.0–11.3)
2: Losing connectedness	12 (10.0–15.3)
3: Not being able to access information	14 (12.0–18.0)
4: Giving up convenience	12 (10.0–17.0)

Note: Data are presented as median and interquartile range (IQR).

Nomophobia and Sociodemographic Variables Among Physiotherapy Students

The survey data revealed that the female students had a significantly higher nomophobia score than the male students (female: med: 47 (IQR: 39–65); male: med: 44 (IQR: 38–52); ($p < 0.001$)). The participants who had never smoked had

a significantly higher nomophobia score compared to those who did (non-smokers: med: 46 (IQR: 38–61); smokers: med: 44 (IQR: 38–49); ($p = 0.004$)). Moreover, the survey data showed that PT students located in the Northern Region of the kingdom had the highest nomophobia score compared to all other regions (Northern Region: med 57 (IQR: 45–76); Western Region: med: 47 (IQR: 37–72); Southern Region: med: 45 (IQR: 45–63); Eastern Region: med: 45 (IQR: 42–52); Central Region: med: 42 (IQR: 38–50); ($p < 0.001$)). However, no difference was found in the nomophobia score between the participants who were single or married (single: med: 45 (IQR: 38–58); married: med: 45 (IQR: 40–45); ($p = 0.99$)), or those who were living with their family and those who were living outside their family home (living with family: med: 45 (IQR: 38–59); living outside the family home med: 45 (IQR: 41–52); ($p = 0.68$)).

Nomophobia and Academic Performance Among Physiotherapy Students

The data from this survey indicated that PT students with a cumulative GPA of less than 3.49 had a significantly higher nomophobia score compared to other students (GPA of < 3.49 : 51 (43–74); GPA of 3.50–4.49: 45 (39–56); GPA 4.50–5.00: 43 (37–57); ($p < 0.001$)). The participants who were in a bridging physiotherapy program had the highest nomophobia score compared to all academic groups (first year: 43 (38–50); second year: 45 (39–54); third year: 44 (36–55); fourth year: 47 (39–67); internship: 50 (41–55); bridging program: 51 (34–76); ($p = 0.023$)). Moreover, the data showed that the participants who reported no academic warnings had the highest nomophobia score among all the groups (no warnings: 46 (42–50); one warning: 45 (38–62); \geq two warnings: 42 (28–53); ($p = 0.023$)). Finally, the students who spent five hours studying or more per week had the highest nomophobia score compared to all groups (less than an hour: 43 (28–48); one to two hours: 43 (38–47); three to four hours: 44 (38–59); five hours or more: 54 (42–68); ($p < 0.001$)).

Discussion

To the best of our knowledge, only limited studies have investigated the incidence rate of nomophobia and its association with academic achievement among students of various educational levels around the world.^{21,22} However, this study is the first to assess the prevalence of nomophobia and its association with academic performance among undergraduate PT students in the Kingdom of Saudi Arabia. Our study has demonstrated that nomophobia is a common psychological condition among these students, with the preponderance of study participants reporting mild levels of nomophobia. Furthermore, the nomophobia score was significantly higher among female, non-smoker, bridging PT program students who were from the Northern Region of the kingdom, had received no academic warnings, spent many hours studying, and had a cumulative GPA of less than 3.49.

Over recent years, technology has witnessed a rapid spread and has become ingrained in our daily lives. This is particularly so with the smartphone, which contributes positively to communication, entertainment, and education.²³ Conversely, some studies have reported that overexposure and the excessive utilization of smartphones are closely linked to several negative consequences related to nomophobia, including psychological distress, emotional loneliness, and sleep disturbance.^{4,24} Further, a study conducted among 200 Indian medical students found that excessive use of mobile phones was a distractor that compromised academic performance by impairing concentration and interfering with the learning process.²⁵

Our study results demonstrated that the prevalence rate of nomophobia was about 98% across all respondents, with most of them (74.8%) manifesting mild nomophobic behavior. These findings are consistent with several related studies that used the same assessment tool, which is the NMP-Q. These findings are relatively consistent with a recent study by Aldhahir et al that examined a sizable sample ($n=1428$) of respiratory therapy students in Saudi Arabia and revealed that nomophobia was prevalent in nearly 97% of them, with around 48% of them experiencing moderate levels of nomophobia.¹³ Corroborating our findings, many recent studies carried out among undergraduate medical students in Brazil and India indicated that approximately 99% of the entire population experienced nomophobia, with around 64–67% of the overall participants having a moderate level of nomophobia.^{10,26,27} Similarly, other related studies among university students in India and Ghana have shown a prevalence rate estimated at 96–99%, with 59% of the total respondents enduring a moderate level of nomophobia.^{28,29} Moreover, a cross-sectional study conducted among health sciences students at King Khalid University in Saudi Arabia found that the incidence percentage of nomophobia was 85.3%, with 22.1% experiencing severe nomophobia and 63.2% suffering from mild nomophobia.³⁰ However, students

of applied medical sciences were more vulnerable to severe nomophobia compared to students of medicine (34.4% vs 16.3%, respectively).³¹

Concerning the relative effect of sociodemographic variables on nomophobia, it was found that the mean scores of female PT students on the nomophobia scale were substantially higher on the nomophobia scale compared to male students. This can be a result of cell phone dependence, which raises the probability of developing smartphone addiction. These findings are identical to a systematic review of 40 articles collated by Notara et al, which revealed a statistically significant difference in nomophobia score in terms of gender, as female students reported a higher score than their male counterparts.³² Similar to our study, a recent study by Schwaiger & Tahir found that there was a significant relationship between gender and nomophobia scores among Pakistani students, showing that female students had higher nomophobia levels than male students.¹⁹ Further studies illustrated similar outcomes in Turkey, Spain, and India.^{33–36} Conversely, several previous studies indicated that the levels of nomophobia among students differed significantly from each other by gender, in favor of males as they tended to use smartphones to expand their level of independence, while females utilized the technology for communication.^{8,37,38} These outcomes are further contradicted by other studies in India and Iran, which demonstrated a non-significant association between a nomophobia score and gender.^{39,40}

Regarding the issue of smoking, our current study discovered that non-smokers were more prone to developing nomophobia. While some studies among university students in Oman and Turkey revealed no significant difference between nomophobia and smoking habits, this may be due to a small sample size or a lack of smoker participants.^{21,41} Similarly, Dib et al found in a study among the Lebanese population that nomophobia and smoking were unrelated. However, a significant correlation was reported between nomophobia and waterpipes because of the length of time spent using a hookah.⁴² Concerning the location of the participants, students in Saudi Arabia's Northern Region scored higher on nomophobia than their peers in other locations. Whereas a cross-sectional study conducted among Saudi Arabian respiratory therapy students indicated that students who lived away from their families had significantly higher nomophobia scores than students who resided with their families.¹³ Our study outcomes may have been a result of psychological stress and smartphone addiction. According to Pavithra et al, medical students experience profound stress if they lose their cell phone, run out of battery power, or cannot access the internet network. This may result in problematic behaviors.⁴³ Tams et al also showed that individuals with nomophobia have greater stress levels.⁴⁴ Additionally, a relevant study found that utilizing smartphones in the classroom has beneficial implications for the educational process. However, excessive smartphone use may detrimentally impact students' academic performance.⁴⁵

According to our findings, students with cumulative GPAs below 3.49 had substantially higher nomophobia scores. These results are analogous to those of a related study by Erdem et al, which found that nomophobia detrimentally affected the academic success of Turkish university students.⁴⁶ Likewise, several studies conducted on students of different educational levels illustrated a significant effect of nomophobia on cumulative GPA. Meanwhile, students who did not experience nomophobia reported excellent academic performance.^{22,29} Cheever et al noted that students with nomophobia may manifest suspicious behaviors that impede cognition and concentration, which negatively affect academic achievement.⁴⁷ In a systematic review conducted by Devi et al, it was pointed out that excessive use of smartphones is significantly correlated with students' poor academic performance. In addition, it induces detrimental psychological symptoms, including anxiety and low self-esteem.⁴⁸ In a cross-sectional study among nursing students in Turkey, it was found that using smartphones in classes diverts students' attention away from theoretical lessons.⁴⁹ Therefore, our study outcomes provided valuable insights to the society since it revealed the consequences of nomophobia on students' academic performance, which necessitates the implementation of preventive measures to reduce this phenomenon.

Furthermore, our study showed that PT students in the bridging program had a significantly higher nomophobia score compared to other academic categories. In a study carried out by Gupta et al on medical students in India, it was found that first-year students had the highest nomophobia scores, while interns had the lowest scores.⁵⁰ While a recently published study on RT students in Saudi Arabia reported that third-year students scored higher than their peers on the nomophobia scale.¹³ In contrast, some studies have reported that there is no statistically significant association between the score of nomophobia and academic level.^{21,29,51} Inconsistency in the results may be due to different psychological factors, such as depression and anxiety. Studies have revealed that levels of depression and anxiety are significant

indicators of the nomophobia score among university students.^{52,53} In a study conducted by Kim et al, students frequently used their phones for extended periods to counteract the negative impacts of depression.⁵⁴ According to Green et al, individuals who are addicted to using their smartphones excessively are more likely to experience depression, which exposes them to psychosocial distress.⁵⁵ As such, Kliestik et al revealed that using a smartphone frequently can be a problematic behavior since it contributes negatively to inducing symptoms of anxiety and depression.⁵⁶

Interestingly, our study findings reported that students with no academic warnings and a weekly study time of five hours or more scored higher on the nomophobia scale than their peers. These findings are congruent with those of Al Aldhahir et al, who observed that RT students who did not receive any academic warnings and who spent five hours studying per week had greater nomophobia scores than their counterparts.¹³ Our study outcomes may be related to electronic learning on digital platforms. According to numerous studies, using smartphone technology in educational spheres has favorable impacts since it provides instant access to evidence-based materials, scientific journals, and medical applications.^{57–59} On the other hand, a study by Jamal et al indicated that the excessive use of smartphones among medical students was closely linked to several negative influences, including sleep disturbances, headaches, impaired memory, and concentration levels.⁶⁰ Moreover, Awasthi et al found that 42% of Indian undergraduate medical students were addicted to their phones, which had a major effect on their quality of life.⁶¹ Further study is needed to identify effective interventions to mitigate the widespread of nomophobia among PT students. Additionally, anxiety and depression levels associated with nomophobic PT students are warranted.

Strength and Limitations

Being the first study to explore the prevalence of nomophobia and its association with academic performance among undergraduate PT students in Saudi Arabia is a significant strength. Furthermore, the study involves a large sample size of the target population from various regions to generalize the research results across Saudi Arabia. However, the study is limited because it used a convenience sampling technique and a self-reported questionnaire to collect data to evaluate the effect of nomophobia on academic performance, which can lead to recall bias as a result of students failing to report the truth. Additionally, our survey was distributed online; therefore, our respondents maybe the PT undergraduate students who were more active or using their smartphones. Further studies are needed to evaluate the causes of nomophobia and its association with academic performance among physiotherapy students in Saudi Arabia.

Conclusion

Nomophobia is common among undergraduate PT students, with the majority experiencing a mild level. Several associated sociodemographic factors such as being female, and being a non-smoker were associated with higher nomophobia levels. Moreover, academic performance indicated by academic warnings, study time, and cumulative GPA were associated factors with the condition. Effective interventions to mitigate the widespread of moderate and severe levels of nomophobia among college students is crucially needed.

Disclosure

The authors report no conflicts of interest in this work.

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