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Nomophobia and psychological loneliness: Their relationship to sleep disorders among university students in Middle Eastern countries

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Abstract: This study explored the level of nomophobia among university students in relation to psychological loneliness, sleep disorders, smartphone usage, age, and the duration of smartphone ownership. A sample of 2162 students from Middle Eastern countries: Jordan (n = 470), Saudi Arabia (n = 279), United Arab Emirates (n = 315), Egypt (n = 625), Oman (n = 237), and Sudan (n = 189) (female = 1706; 78.9%; mean age = 33.36, SD = 10.69). Data were collected using the Nomophobia Questionnaire (Yildirim et al., 2016), the UCLA Psychological Loneliness Scale (Russell, 1996), the Sleep Disorders Questionnaire, and a demographic questionnaire. Overall, the level of nomophobia was moderate (M = 64.12, SD = 16.9). In addition, Saudi students scored the highest (M = 3.35), while Sudanese students scored the lowest (M = 3.07). A stepwise multiple regression analysis indicated that sleep disorders were the strongest predictor of nomophobia, followed by daily smartphone usage and participants' age. The findings further revealed significant cross-national and demographic variations, particularly higher levels of nomophobia among Saudi and married participants. Significant differences were also observed by type of work, those who work at the public-sector showed higher nomophobia scores compared to students. Gender differences were not significant, suggesting that smartphone dependence is similar for both males and females. The results confirmed that behavioral and sleep-related factors explain nomophobia more strongly than emotional loneliness. The Findings are consistent with Work–Life Balance Theory (Clark, 2000) concerning how blurred boundaries and functional motivations reinforce nomophobia behaviors. These findings suggest the need for targeted student counselling and guidance programs that address smartphone overuse, promote healthy sleep hygiene, and support students' psychological well-being through preventive approaches.

Keywords: nomophobia; psychological loneliness; sleep disorders; excessive use of smartphones; university students; Middle East countries

Introduction

Young people seem unable to go out for a short time without their smartphones, a phenomenon termed nomophobia (Al-Tantawi, 2022). They may experience feelings of fear, tension, anxiety, confusion, and discomfort when unable to communicate with others. Within student communities, nomophobia weakens students' academic achievement. It can cause many physical symptoms of pain to one's joints, muscles, and eyes. Studies on nomophobia have increased over the past decade, with the largest-scale studies focusing on Western and East-Asian contexts (León-Mejía et al., 2021; Yildirim & Correia, 2015). Evidence from Middle Eastern and North African (MENA) countries remains limited despite high smartphone usage (Bouazza et al., 2023; GSMA Intelligence, 2024). This cross-national study addresses this gap by providing data from Jordan, Saudi Arabia, the UAE, Egypt, Oman, and Sudan.

Nomophobia and psychological loneliness

As previously noted, nomophobia is associated with extreme attachment and high levels of fear of being without a mobile phone or cellular service. It is associated with discomfort, anxiety, and nervousness, and psychological disorders like loneliness and sleep disorders (Bragazzi and Del Puente, 2014). This condition is exacerbated in places where smartphone use is prohibited, leading to excessive checking of smartphone screens for messages and calls (Abdel-Warith, 2020). Yildirim et al. (2016) reported that nomophobia causes anxiety, tension, fear, isolation, introversion, lack of integration into social and cultural activities, headache, dizziness, and fatigue, all of which can cause sleep disorders. Nomophobia is also associated with fear, anxiety, depression, rejection from others, and psychological loneliness, all of which negatively affect the individual's life. This disorder is closely associated with mental health problems such as anxiety, stress, and sleep disorders (Yildirim & Correia, 2015). Regarding the relation between nomophobia and psychological loneliness, Bragazzi and Del Puente (2014) indicated that manifestations of nomophobia include lack of direct social interactions, panic attacks when losing the smartphone, distortion of thinking, and inability to make important decisions, all of which can affect sleep quality.

Nomophobia and sleep disorders

Excessive use of smartphones disturbs people's sleep patterns, e.g., staying up late or constantly checking the phone during the night. This causes insufficient and

intermittent sleep (Yildirim & Correia, 2015). High levels of nomophobia are also associated with increased feelings of psychological loneliness, especially among students who use their smartphones for social interaction (Abdallah & Faraj, 2023). Constant checking of notifications from smartphone applications and checking emails before bed hinders the body's ability to relax and sleep. A person with nomophobia may suffer from insomnia. Students are most affected by problems resulting from smartphone use, e.g., lack of psychological security, Internet addiction, and sleep problems, including insomnia (Sui & Sui, 2021). Al-Rashidi & Jad Al-Rab (2022) and Al-Harbi (2023) found an association between nomophobia and many psychological problems, e.g., loneliness, anxiety, and depression.

Theoretical foundations

Work-Life Balance Theory (Clark, 2000) offers a lens to understand nomophobia. It suggests that individuals negotiate boundaries between work, study, and personal life. According to Clark (2000), when these boundaries become highly permeable due to excessive smartphone usage, individuals experience greater role interference and reduced psychological detachment. Constant digital access extends academic and social responsibilities into personal time, leaving little opportunity for mental recovery. This boundary blurring increases stress and sleep disturbance, reinforcing anxiety and psychological strain. For students, constant smartphone availability may disrupt rest and social life, contributing to sleep difficulties and heightened anxiety when disconnected, which explains the link between smartphone dependence and nomophobia (Clark, 2000).

The middle eastern and north africa context

Abdallah and Faraj (2023) investigated nomophobia in five Arab countries (Egypt, Saudi Arabia, Jordan, Lebanon, and Bahrain) between 2021 and 2022. Their results revealed that about 24.2% of university students suffer from smartphone addiction (nomophobia), with Egypt having the highest frequency. The study reported demographic differences, indicating that females were 15% more likely to experience nomophobia. Anxiety was found to be the major factor increasing the risk of developing nomophobia.

However, a study by Al-Haik and El-Abadsa (2022) reportedthatno statistical differences were found in nomophobia by some demographic variables, such as the educational level and the duration of owning a smartphone, whereas there were differences by the field of study in favor of humanities specializations. A study conducted in the Middle East showed that students working in the private sector tend to have higher levels of nomophobia than their counterparts in the government sector, owing to the nature of work in the private sector that requires the constant use of smartphones to stay in touch with clients and colleagues (Abdulrahman et al., 2023). In another study by Hussein (2022), a positive association was observed between nomophobia and psychological loneliness among the general population in the Kingdom of Saudi Arabia.

Goals of the study

This study aimed to investigate nomophobia in relation to psychological and sleep disorders among university students in Middle Eastern countries. addressed the following questions:

1. What is the level and frequency of nomophobia among university students in selected Middle Eastern countries?
2. Are there significant differences in nomophobia according to demographic variables (country, gender, type of work, marital status, and type of college)?
3. To what extent can psychological loneliness, sleep disorders, daily hours of smartphone use, and years of smartphone ownership predict nomophobia among university students?

Method

Participants and setting

A cohort of 2162 male (456, 21.1%) and female (1706, 78.9%) university students from six Middle East countries participated in the study: Jordan (470 participants, 21%), Saudi Arabia (279 participants, 12.9%), United Arab Emirates (315 participants, 14.6%), Egypt (625 participants, 29%), Oman (237 participants, 11%), Sudan (189 participants, 8.7%), and various countries: Syria, Palestine, and Turkey (47 participants, 2.1%).

Participants' ages ranged from 18 to 58 years, with a mean age of 33.36 years (SD = 10.69). Age groups were distributed as follows: 942 participants (43.6%) were 21 years old or younger (M = 63.28, SD = 16.64), 1007 participants (46.6%) were between 22 and 39 years old (M = 64.35, SD = 17.23), and 213 participants (9.8%) were 40 years old or older (M = 66.76, SD = 16.96).

As for the marital status, 1463 (67.7%) were unmarried, 627 (28.7%) were married, and 79 (3.7%) were divorcees. Regarding employment, 466 participants (21.6%) worked in the public sector, 113 (5.2%) in the private sector, 1439 (66.6%) were students, and 144 (6.7%) were unemployed. In terms of education, 1523 (70.4%) were undergraduate students, while 639 (29.6%) were postgraduate students. As for college type, 1156 (53.5%) were from humanities colleges, 764 (35.3%) from scientific colleges, and 242 (11.2%) from health college. The Table 1 shows these data.

Measures

The nomophobia questionnaire

The Nomophobia Questionnaire developed by Yildirim et al. (2016) was used in this study. It consists of 20 items in four subscales measuring one latent trait: Not being able to communicate (4 items; e.g., "I would feel uncomfortable without constant access to information through my smartphone"), losing connectedness (5 items; e.g., "If I cannot use my smartphone, I would be afraid of being left out of contact"), Not being able to access information (6 items; e.g., "Being unable to get information from my smartphone makes me nervous"), and giving up convenience (5 items; e.g., "If I did not have my smartphone with me, I would feel anxious"). Items on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly

Table 1. Demographic characteristics of the participants

Variable	Category	n	%
Gender	Male	456	21.1
	Female	1706	78.9
Country	Jordan	470	21.0
	Saudi Arabia	279	12.9
	United Arab Emirates	315	14.6
	Egypt	625	29.0
	Oman	237	11.0
	Sudan	189	8.7
	Syria, Palestine, Turkey	47	2.1
Age Group	≤21 years	942	43.6
	22–39 years	1007	46.6
	≥40 years	213	9.8
Marital Status	Unmarried	1463	67.7
	Married	627	28.7
	Divorced	79	3.7
Employment	Public sector	466	21.6
	Private sector	113	5.2
	Student	1439	66.6
	Unemployed	144	6.7
Education Level	Undergraduate	1523	70.4
	Postgraduate	639	29.6
College Type	Humanities	1156	53.5
	Scientific	764	35.3
	Health	242	11.2

agree". In the present study, Cronbach's alpha for the overall NMP-Q score was 0.945.

The sleep disorders questionnaire

The Sleep Disorders Questionnaire (SDQ) consists of 22 items on a five-point scale ranging from 1 "never or almost never true of me" to 5 "always or almost always true of me". 0.43 and 0.74. The reliability SDQ scores in the present study was 0.93.

The psychological loneliness questionnaire

The Psychological Loneliness Questionnaire (PLQ, Russell, 1996) consists of 20 items on a 5-point Likert scale. from 1 "never or almost never true of me" to 5 "always or almost always true of me". Items indicating lack of psychological loneliness were reverse coded. The reliability of PLQ scores was 0.94 in the present study.

Control variables

Control variables included gender, age, marital status, type of college (humanities, science, health), work status (public, private, student, unemployed), and duration of smartphone ownership. These were entered as covariates in supplementary analyses were indicated.

Procedure

Ethics approval for the study was obtained from the Jordan Academicians League, Ref No.: 19/2023, ensuring that all procedures complied with established ethical standards for research involving human participants. Prior to data collection, informed consent was obtained from participants who were provided with detailed information about the purpose, procedures, potential risks, and benefits of the study.

Data analysis

To answer the question related to the level and frequency of nomophobia among the participants, descriptive statistics were used (frequencies, percentages, means and standard deviations).

Collinearity issues were checked using Variance Inflation Factor (VIF) values. The VIF values were less than 10 (Average VIF < 1.5), which indicated that there were not multi collinearity problems. Data in Table 2 indicated that nomophobia could be predicted by sleep disorders, hours of smartphone daily use, and age. Psychological loneliness and the duration of smartphone ownership were not multicollinearity problems significantly predict nomophobia ($R^2 = 0.172$ for step 1, $F(2160) = 449.313$, $p < 0.001$; for step 2, $\Delta R^2 = 0.021$, $F(2159) = 258.165$, $p < 0.001$; for step 3, $\Delta R^2 = 0.016$, $F(2158) = 190.471$, $p < 0.001$, for step 4, $\Delta R^2 = 0.003$, $F(2157) = 145.485$, $p < 0.001$, for step 5, $\Delta R^2 = 0.003$, $F(2156) = 117.997$, $p < 0.001$).

Stepwise multiple regression analysis was conducted to identify the predictive ability of psychological loneliness, sleep disorders, hours of smartphone daily use, and the duration of smartphone ownership in nomophobia. The prediction equation can be expressed as follows:

Table 2. The stepwise multiple regression for predictors of nomophobia (N = 2162)

Variable	B	Std. Error	β	t	Sig.
Step 1					
Constant	42.327	1.081		39.172	<0.001
Sleep disorders	0.375	0.018	0.415	21.197	<0.001
Step 2	Step 2				
Constant	32.763	1.668		19.642	<0.001
Sleep disorders	0.358	0.018	0.396	20.323	<0.001
Usage hours	4.074	0.546	0.145	7.460	<0.001
Step 3					
Constant	25.287	1.995		12.677	<0.001
Sleep disorders	0.371	0.018	0.411	21.156	<0.001
Usage hours	4.480	0.544	0.160	8.235	<0.001
Age	3.395	0.508	0.130	6.682	<0.001
Step 4					
Constant	27.053	2.081		13.001	<0.001
Sleep disorders	0.400	0.020	0.443	19.933	<0.001
Usage hours	4.506	0.543	0.161	8.296	<0.001
Age	3.145	0.514	0.120	6.113	<0.001
Psychological loneliness	−0.060	0.020	−0.066	−2.923	0.003
Step 5					
Constant	24.738	2.267		19.943	<0.001
Sleep disorders	0.399	0.020	0.442	7.950	<0.001
Usage hours	4.343	0.546	0.155	4.675	<0.001
Age	2.600	0.556	0.099	−2.789	<0.001
Psychological loneliness	−0.057	0.020	−0.063	2.557	0.005
Duration of ownership	2.037	0.797	0.053	19.943	0.011

Note. $R^2 = 0.172$ for step 1 ($p < 0.001$); $R^2 = 0.193$ for step 2 ($p < 0.001$); $R^2 = 0.209$ for step 3 ($p < 0.001$); $R^2 = 0.212$ for step 4 ($p = 0.003$); $R^2 = 0.215$ for step 5 ($p = 0.011$).

Nomophobia = 24.738 + 0.399 × (sleep disturbances) + 4.343 × (average hours of use) + 2.600 × (age) − 0.057 × (psychological unit) + 2.037 × (years of ownership).

The *t*-test was used to identify differences in nomophobia by sociodemographic. The one-way analysis of variance (ANOVA) test was used to identify differences by country, marital status, type of work, and type of college. Pearson correlation coefficients were calculated to explore the relationships between the study variables. Finally, the stepwise multiple regression analysis was conducted to identify the predictive ability of psychological loneliness, sleep disorders, hours of smartphone daily use, and the duration of smartphone ownership in nomophobia.

Results and Discussion

Descriptive statistics

The level of nomophobia by country

Means and standard deviations were used to identify the level of nomophobia in the target countries. These results are shown in Table 3.

The results showed that 31.7%, 51.4%, and 16.9% of participants exhibited high, moderate, and low levels of nomophobia, respectively. These rates are somewhat consistent with the prevalence rates of nomophobia reported in some other studies (Alhusseini et al., 2025; Alwafi et al., 2022; León-Mejía et al., 2021) But The results of the study showed statistically significant differences in the level of nomophobia between the participating countries

Table 3. The level of nomophobia by country

Country	N	M*	SD
Jordan	470	65.02	17.904
Saudi Arabia	279	66.92	17.524
United Arab Emirates	315	62.20	16.872
Egypt	626	64.64	15.936
Oman	237	62.59	15.616
Sudan	189	61.49	18.462
others	46	62.83	15.702
Total	2162	64.12	16.971

Note. *The total score = 100.

(F = 3.395, $p = 0.019$). The highest level of nomophobia (M = 66.92, SD = 17.52) was reported for Saudi participants, while the lowest level (M = 61.49, SD = 18.46) was reported for participants from Sudan.

These results are consistent with previous studies that showed that levels of nomophobia vary by countries due to differences in cultural and economic contexts and the availability of technology (Yildirim & Correia, 2015). The rise in nomophobia in Saudi Arabia may be explained by the excessive use of smartphones as a result of the expansion of digitization in all aspects of daily life, including education and government services (Al-Harbi, 2023). These differences can be explained in light of the Diffusion of Innovations Theory that contends that the adoption of

Table 4. The ANOVA test for differences in nomophobia by country

Variable	Source of variance	Sum of squares	df	Mean squares	F-value	Sig.
Country	Between groups	5828.070	6	971.345	3.395	0.002
	Within groups	616,542.937	2155	286.099		
	Total	622,371.007	2161			

Table 5. The *t*-test for difference in nomophobia by gender

Variable	Group	N	M	SD	t-value	Sig.
Gender	Males	456	64.05	16.785	0.088	0.930
	Females	1706	64.14	17.032		

Table 6. The ANOVA test for One-way analysis for differences in nomophobia by the marital status

Variable	Source of variance	Sum of squares	df	Mean squares	F-value	Sig.
Country	Between groups	7024.860	2	3512.430	12.324	<0.001
	Within groups	615,346.147	2159	285.014		
	Total	622,371.007	2161			

modern technology varies from a country to another based on culture, which affects the level of nomophobia (Rogers, 2003).

As shown in Table 3, the highest level of nomophobia was in Saudi Arabia with a mean of 66.9, followed by Jordan (M = 65.0), Egypt (M = 64.69), Oman (M = 62.6), United Arab Emirates (M = 62.2), and finally Sudan (M = 61.5).

Differences in nomophobia by country

A one-way analysis of variance was conducted to identify differences in nomophobia by country. Table 4 shows these results.

Table 4 shows significant differences in Nomophobia scores across countries. Post-hoc comparisons using Tamhane's test revealed significant differences between Saudi Arabia and the United Arab Emirates ($p = 0.032 < 0.05$) as well as between Saudi Arabia and Sudan ($p = 0.002 < 0.05$), with higher Nomophobia scores in Saudi Arabia compared to both the United Arab Emirates and Sudan.

Differences by gender

The independent samples *t*-test was used to explore the differences in nomophobia between males and females. Table 5 shows these results.

Data in Table 5 shows that there were no statistically significant differences ($p = 0.93 > 0.05$) between males and females in nomophobia.

Differences in nomophobia by the marital status

A one-way analysis of variance was calculated to investigate differences in nomophobia by the marital status (married, unmarried, and divorced). Table 6 shows these results.

Table 6 shows significant differences in nomophobia based on marital status. The Scheffé post hoc analysis revealed significant differences between married and unmarried participants ($p < 0.001 < 0.05$), with married participants showing higher levels of nomophobia. There were also significant differences between unmarried and divorced participants ($p = 0.006 < 0.05$), with divorced participants showing higher levels of nomophobia.

Prediction of nomophobia by and sleep disorders, age, hours of the smartphone daily use, and the duration of smartphone ownership

The stepwise multiple regression analysis was used to identify the predictive ability of psychological loneliness, sleep disorders, age, hours of the smartphone daily use, and the duration of smartphone ownership in nomophobia.

Sleep disorders were the best predictor of nomophobia. They could explain (18.3%) of the variance in nomophobia as indicated in the first model. In the second model, sleep disorders and hours of smartphone daily use together explained (19.3%) of the variance in nomophobia. Thus, the hours of smartphone daily use variable increased the explained variance by 0.021, which is a statistically significant value ($p = 0.01$). In the third model, sleep disorders, hours of smartphone daily use, and age together could explain (20.9%) of the variance in nomophobia. Thus, the age variable could increase the explained variance by 0.015, which is a statistically significant value ($p = 0.01$). In the fourth model, sleep disorders, hours of smartphone daily use, age, and psychological loneliness together explained (21.2%) of the variance in nomophobia. Thus, the psychological loneliness variable increased the explained variance by0.003. Finally, in the fifth model, sleep disorders, hours of smartphone daily use, age, psychological loneliness, and the duration of smartphone ownership together were able to explain (21.5%) of the variance in Nomophobia. Thus, the duration of smartphone ownership was able to increase the explained variance by 0.003.

Our results indicated the importance of sleep disorders and excessive daily use as the most important factors increasing the level of nomophobia, while other variables

such as age, the duration of smartphone ownership, and psychological loneliness showed varying but statistically significant effects. The results of the multiple regression analysis showed that sleep disorders were the strongest predictor of nomophobia ($\beta = 0.415, p < 0.001$). This finding is echoes previous studies that indicated that excessive use of smartphones, especially before bedtime, leads to sleep disorders such as insomnia and decreased sleep quality (Demirci et al., 2015; Li et al., 2021). This finding shows that anxiety associated with digital disconnection can increase nighttime anxiety and sleep disorders (Yildirim & Correia, 2015). This relationship can be explained by the Uses and Gratifications Theory that contends that individuals use phones as a means of relieving stress, which, in turn, leads to sleep disorders due to excessive smartphone use during the night (Katz et al., 1974).

Psychological disordered loneliness. In this study, psychological loneliness showed a small but statistically significant effect on nomophobia. Conversely, previous studies suggest that loneliness can increase reliance on smartphones as a means of social communication, which may increase levels of nomophobia (Bian & Leung, 2015). The effect of psychological loneliness on nomophobia was negative ($\beta = -0.063$, $p = 0.005$), meaning that individuals who felt less lonely were more likely to have nomophobia. At first glance this result may seem surprising. However, it can be explained according to the Social Deficit Theory, which suggests that individuals use smartphones to compensate for lack of actual social interaction (Bian & Leung, 2015). This finding contradicts the results of the study by Yildirim and Correia (2015), which showed that increased feelings of psychological loneliness are associated with higher levels of nomophobia.

Finally, our results showed that the duration of smartphone ownership had a small but statistically significant positive effect on nomophobia ($\beta = 0.053$, $p = 0.011$). This finding supports the hypothesis that individuals who own phones for long periods may become more attached to them and fear losing them (King et al., 2014). The Habituation and Adaptation Theory may explain this finding. Individuals increasingly adapt to technology over time, making them more sensitive to losing access to it (Helson, 1964). This finding is in line with the study of Yildirim and Correia (2015), which reported that the duration of smartphone ownership is associated with an increased risk of developing nomophobia.

Phone usage effects. The hours of daily phone use were a statistically significant predictor of nomophobia ($\beta = 0.145$, $p < 0.001$). This finding echoes the literature asserting that excessive smartphone use is associated with increased social anxiety and fear of losing connection (Elhai et al., 2017; Montag & Reuter, 2015). These studies indicate that heavy reliance on smartphones can lead to addictive behaviors associated with nomophobia. This finding is also consistent with the study by Abdallah and Faraj (2023), which reported a positive relationship between the average hours of phone use and nomophobia. These results support the Internet Addiction Theory, which indicates that excessive use of smartphones leads to increased psychological attachment to them, which, in turn, increases anxiety levels when losing phones (Young, 1998).

Collateral findings

Differences in nomophobia by college type

To explore differences in nomophobia by college type (humanities, science, health), the ANOVA test was performed.

As listed in Table 7, there were significant differences in nomophobia based on college type ($p = 0.004 < 0.05$). The Scheffé test revealed statistically significant differences between students in scientific and humanities colleges ($p < 0.005 < 0.05$), with students from humanities colleges showing higher levels of nomophobia.

Differences in nomophobia by type of work

The ANOVA test was conducted to investigate differences in nomophobia by the type of work (public, private, student, and unemployed). These results are listed in Table 8.

Table 8 shows that there were significant differences in Nomophobia by the type of work ($p < 0.001 < 0.05$). The Scheffé test showed that there were statistically significant differences between participants working in the public sector and students ($p < 0.001 < 0.05$) those working in the public sector were showing higher levels of nomophobia.

No statistically significant gender differences in nomophobia were found in this study. This finding is in line with some studies reporting lack of significant differences between males and females in nomophobia (Agrawal & Mary, 2023). This result is not in line with some studies that reported females as being more susceptible to nomophobia due to their greater emotional attachment to social media (Essel et al., 2022; Macias & Salas, 2022b; Abdallah & Faraj, 2023). Our results showed no statistically significant differences between males and females ($t = 0.088$, $p = 0.930$). This finding may indicate that nomophobia affects individuals regardless of their gender. This finding is consistent with the results of recent studies that indicated a narrowing of the gender gap in the use of technology (Abdallah & Faraj, 2023). This finding is also consistent with the Digital Equality Theory, which suggests that the increasing adoption of technology by both males and females reduces behavioral differences between them (Helsper, 2010). The lack of gender differences also converges with recent research indicating that gender differences in the use of technology have diminished with the spread of smartphones and their multiple uses in daily life; In the context of the Middle East, gender differences in smartphone use may be less evident due to social and cultural shifts in the region, e.g., increased women empowerment and encouragement to participate in digital life, education, and the workplace. This is in line with local studies that indicate a narrowing of the digital gender gap in Arab countries (Al-Harbi, 2023).

The results showed statistically significant differences in the level of nomophobia by the marital status ($F = 12.324$, $p < 0.001$). Married and divorced individuals showed a significantly higher level of nomophobia than unmarried individuals. This may be attributed to the fact that married and divorced individuals tend to use

Table 7. The ANOVA test for the differences in nomophobia by college type

Variable	Source of variance	Sum of squares	df	Mean squares	F-value	Sig.
College-Type	Between groups	3207.549	2	1603.774	5.592	0.004
	Within groups	619,163.458	2159	286.783		
	Total	622,371.007	2161			

Table 8. The ANOVA test for the differences in nomophobia by type of work

Variable	Source of variance	Sum of squares	df	Mean squares	F-value	Sig.
Work-type	Between groups	5254.360	3	1751.453	6.125	<0.001
	Within groups	617,116.647	2158	285.967		
	Total	622,371.007	2161			

smartphones to communicate with their families or ex-partners, which increases their psychological attachment to phones (Daei et al., 2020). These results can be explained by the Social Support Theory, as individuals rely on smartphones as a means of staying in touch with others in the absence of direct social support. A different finding was reported by the study conducted by Abdallah and Faraj (2023), which indicated that unmarried students suffer from higher levels of nomophobia than married students.

Statistically significant differences in nomophobia were found in this study by college type ($F = 5.592$, $p = 0.004$). Students in humanities colleges scored significantly higher than students in scientific and health colleges. This result is consistent with the results of the studies of Al-Haik and El-Abadsa (2022) and (Yildirim & Correia, 2015). A possible explanation for this finding is that students of humanities colleges may use smartphones more for social communication and information search, which increases their attachment to them (Akyol et al., 2021). This finding supports the Social Identity Theory, which contends that individuals use technology to enhance their sense of belonging to specific social groups (Tajfel & Turner, 1979).

As for the effect of the type of work, statistically significant differences in nomophobia were found between different categories ($F = 6.125$, $p < 0.001$). Participants working in the public sector reported higher levels of nomophobia compared to students. This may be due to by the increased reliance on smartphones in government work to coordinate meetings and professional communications (Macias & Salas, 2022a). This finding can be explained by the This finding differs from some studies that showed differences in nomophobia among private sector workers (Abdulrahman et al., 2023) and among non-working students (Abdallah & Faraj, 2023; Yildirim & Correia, 2015). In light of these conflicting results, there is still an urgent need to conduct further experimental investigation of this variable and its effect on nomophobia.

Predicting nomophobia through a set of variables

Although it was expected that young people would be more susceptible to nomophobia, the results surprisingly showed that older age is associated with a slight increase in levels of nomophobia ($\beta = 0.099$, $p < 0.001$). Although some research has found that young people under30 years are more susceptible to nomophobia (King et al., 2014; Abdallah & Faraj, 2023; Yildirim & Correia, 2015), our results are consistent with other research indicating that older adults may rely more on their phones to stay in touch with others (Bragazzi & Del Puente, 2014). These finding can be explained based on the Attachment Theory, which suggests that emotional dependence on digital devices may increase with age to compensate for the feeling of social isolation (Bowlby, 1969).

Implications for research and practice

Universities and policymakers should develop targeted digital-wellbeing programs that focus on reducing excessive nighttime smartphone use and improving sleep hygiene among students. Counseling centers could incorporate screening for nomophobia and sleep disturbances into routine mental-health assessments. At the policy level, institutions may consider guidelines to reduce unnecessary after-hours digital demands on employees and students. Future research should evaluate the effectiveness of brief cognitive-behavioral or psychoeducational interventions to reduce nomophobia and improve sleep outcomes. Based on the study results, there is a need to develop guidance and awareness programs aimed at reducing nomophobia, with a focus on reducing excessive use of smartphones, especially at night, to reduce sleep disorders. These programs could include workshops in universities and schools to educate students on how to manage their time on smartphones and the importance of healthy sleep. Since governmental work was associated with higher levels of nomophobia, institutions should implement policies to promote digital mental health. For example, they can reduce reliance on smartphones in meetings and increase breaks from screens during work hours. The study recommends the use of digital time management applications and digital well-being techniques, e.g., “screen time” that help individuals control their use of smartphones and reduce daily usage hours, which can reduce nomophobia. The results of this study can be used to design treatment programs targeting individuals with high levels of nomophobia, e.g., Cognitive Behavioral Therapy (CBT), which has proved effective in reducing excessive reliance on smartphones (King et al., 2014). Abdel-Warith (2020) suggests that psychological loneliness makes one feel isolated even in the presence of others. It is a painful psychological

and personal experience that one experiences as a result of feeling lack of acceptance, love and attention from others. As a result of the excessive use of the smartphone by students and their attachment to it, they resort to creating a virtual reality parallel to the actual reality, which leads them to withdraw and isolate themselves from their milieu. Negative isolation and feelings of loneliness are positively related to nomophobia, and feelings of isolation and withdrawal are more closely related to the fear of losing contact (Lu et al., 2022).

Limitations of the study and suggestions for further study

Although the study achieved its aims of exploring the factors influencing nomophobia in a wide range of countries in the Middle East, not all population categories were represented in the non-random sample, which may limit the generalizability of results. In addition, the study used self-report methods to collect data, which may lead to social desirability bias in the responses. Future research would better use objective assessment tools, e.g., applications that track actual smartphone usage to guarantee the accuracy of the data. The sample is predominantly female (1706; 78.9%), which may limit the generalizability of our results to male university students. Although an independent samples *t*-test in the current sample found no significant difference in nomophobia scores between males and females ($t = 0.088$, $p = 0.930$), we advise caution when generalizing findings across sexes. Future studies should seek more balanced samples or apply sampling weights to improve representativeness. The sample's mean age ($M = 33.36$, $SD = 10.69$) reflects the inclusion of both undergraduate and postgraduate students and a notable proportion of working students. Although the dataset includes a substantial subgroup of younger students (43.6% aged ≤ 21), the overall mean is pulled upward by older participants. This heterogeneity reduces the extent to which the sample represents a narrow 'traditional' undergraduate population; future work using stratified or probability sampling focused on specific student-age cohorts would help to clarify age-specific patterns.

Future studies are recommended to use diverse methods of data collection, e.g., interviews, observation, and the investigation of nomophobia in different cultural contexts. Since this study followed a descriptive comparative design, it is difficult to determine causality among variables. Therefore, longitudinal studies are recommended to examine the long-term impact of nomophobia and understand changes in behavioral patterns over time. This study focused on Middle East countries, which means that the results may not be generalizable to other cultures with different social and economic contexts. Therefore, it is advisable to conduct similar studies in different geographical areas to compare the results.

Conclusion

This study highlights that nomophobia is moderately prevalent among university students in Middle Eastern countries, with significant variations between nations. Sleep disorders, daily smartphone use, and age were identified as the strongest predictors of nomophobia. Psychological loneliness also plays a key role, as students may withdraw into virtual realities, intensifying feelings of isolation. These findings underscore the importance of addressing both the behavioral and psychological aspects of smartphone dependence. Universities and counseling services should implement targeted interventions, such as digital well-being programs, workshops on healthy smartphone habits, and initiatives to improve social connectedness and sleep hygiene. Moreover, raising awareness about the psychological risks associated with excessive smartphone use can foster better mental health among students. Future research is encouraged to explore longitudinal effects, cultural differences, and the effectiveness of preventive and educational programs. Overall, integrating theoretical insights and practical interventions can help mitigate nomophobia and support students' psychological well-being in technology-intensive environment.

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