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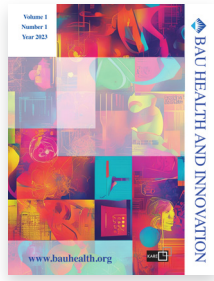

Original Article

The Effects of Nomophobia on Posture, Anxiety, Sleep Quality, and Physical Activity in University Students

Gamze Demircioğlu,[1] Hazal Genç[2]

[1]Department of Physiotherapy and Rehabilitation, Atlas University Faculty of Health Sciences, İstanbul, Türkiye
[2]Department of Physiotherapy and Rehabilitation, Bahçeşehir University Faculty of Health Sciences, İstanbul, Türkiye

Abstract

Objectives: Nomophobia, the fear of being without a cell phone, is prevalent among university students. This study aims to explore the effects of varying levels of nomophobia on posture, anxiety, sleep quality, and physical activity among this demographic.

Methods: A total of 118 university students, aged 18 to 25, participated in this study. They were evaluated on different parameters. The Nomophobia Scale (NMP-Q) was used to measure nomophobia levels, while the International Physical Activity Questionnaire assessed physical activity levels. Sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI), anxiety levels were determined with the Beck Anxiety Inventory (BAI), and posture was assessed using the New York Posture Rating Scale.

Results: A moderate correlation was found between the BAI and NMP-Q scores ($r=0.306$; $p<0.001$), and a positive correlation existed between BAI and PSQI scores ($r=0.356$; $p<0.001$). No statistically significant associations were observed between the other variables ($p\geq0.005$).

Conclusion: This study highlights the impact of increased cell phone use on anxiety, sleep quality, physical activity, and posture among university students. It was found that nomophobia levels are associated with anxiety and sleep quality but not with physical activity levels or posture. Future research should explore intervention methods to address this growing public concern.

Keywords: Anxiety, nomophobia, physical activity, posture, university students.

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The advancements in the modern digital era have revolutionized access to information and connectivity worldwide, primarily through the ubiquitous use of smartphones. These devices have become an inseparable part of daily life, serving not only as tools but also as gateways to social networks, entertainment, information, and improved communication. However, alongside the benefits they offer, excessive smartphone usage has prompted research into various issues, ranging from dependency to other problems associated with its use.[1,2]

Several studies have explored the implications of smartphone addiction, revealing its substantial influence on mental health and daily functioning. Meta-analyses examining countries worldwide have ranked Türkiye as the 8th highest in smartphone addiction prevalence.[3] This phenomenon has led to the emergence of a novel concern known as "nomophobia," characterized by the fear or anxiety of being without one's phone. Nomophobic individuals exhibit anxiety disorders when separated from their phones or when facing situations such as low battery or loss of signal.[4,5]

Address for correspondence: Gamze Demircioğlu, MD. Atlas Üniversitesi Sağlık Bilimleri Fakültesi Fizyoterapi ve Rehabilitasyon Anabilim Dalı, İstanbul, Türkiye
Phone: +90 534 868 95 44 **E-mail:** gamzekantardemircioglu@gmail.com

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The increasing prevalence of smartphone addiction has sparked concerns regarding its psychological, emotional, social, and physical ramifications. Studies have identified a surge in anxiety linked to excessive smartphone usage. Moreover, using electronic devices before sleep, attributed to screen brightness, disrupts rapid eye movement (REM) sleep, thereby reducing sleep duration and causing sleep-related problems.

While smartphones are deemed to promote physical activity through health-related applications, paradoxically, they contribute to reduced engagement in fundamental physical activities like walking, leading to prolonged sedentary behavior and negatively impacting daily life.

This study aims to assess the impact of nomophobia on posture, physical activity, anxiety levels, and sleep patterns in young adult populations, combining objective measurements with self-reported data. Our objective is to provide insights into the multifaceted effects of smartphone addiction and guide efforts toward healthier digital technology usage among the younger generation.[6–9]

Materials and Methods

Students from the Department of Physiotherapy and Rehabilitation in the Faculty of Health Sciences at Bahcesehir University participated in our study. The research utilized the Nomophobia Scale, National Physical Activity Questionary, Pittsburgh Sleep Quality Index, Beck Anxiety Inventory, and New York Posture Index. Conducted between December 5, 2022, and April 10, 2023, at Bahcesehir University, this study received approval from the İstanbul Medipol University Clinical Research Ethics Committee under the number E-10840098-772.02-6790 and adhered to the Helsinki Declaration. Informed consent was obtained from all participants.

Participants within the age range of 18 to 25 were recruited for this study. Exclusion criteria included individuals with a history of hypertension, cardiopulmonary disease, malignancy, recent surgical procedures or injections, as well as those who underwent spinal surgery, presented with psychological disorders, or exhibited neurological and orthopedic deficits.

Power analysis was performed using G*Power 3.1.9.4 software (Universität Düsseldorf, Düsseldorf, Germany). With an effect size of 0.80, a sample size of at least 110 participants was determined to achieve a confidence level of 95% and a power level of 95%. To account for potential participant attrition, each group consisted of 125 individuals.

Nomophobia Scale (NMP-Q): This scale was translated into Turkish by Yildirim and Correia (2015) for validity and reliability. It consists of 20 items across four categories on a seven-point Likert scale. The scale includes four items about not being able to access information, five items about giving up comfort, five items about losing connection, and six items about not being able to communicate. The total score ranges from 20 to 140, with a higher score indicating severe nomophobia. The NMP-Q scores are categorized as follows: "None" is represented by 0 points, "Mild" by 21 to 59 points, "Moderate" by 60 to 99 points, and "High" by 100 to 140 points.[10]

International Physical Activity Questionnaire (IPAQ): This is a common tool for determining an individual's level of physical activity. It includes a variety of physical activities, such as strenuous and moderate exercises performed during work, travel, household tasks, and leisure time. Validated and reliable in Turkish by Saglam et al.[11] (2010), the IPAQ determines weekly energy expenditure estimates in metabolic equivalent (MET) minutes. The frequency (number of days per week) and duration (minutes per day) of different activities in each domain are evaluated by the IPAQ.

Pittsburgh Sleep Quality Index (PSQI): This tool is used to assess sleep quality over the previous month and is validated and reliable in Turkish. It addresses various aspects of sleep, such as duration, latency, disruptions, use of medications, and daytime functioning. An overall sleep quality score is calculated by adding the scores on 19 different items. Higher scores indicate lower sleep quality. The PSQI is used to evaluate sleep disturbances and their impact on health in both clinical practice and research. It is known for its reliability and ease of use.[12]

Beck Anxiety Inventory (BAI): This inventory has three factors: physical symptoms, emotional symptoms, and somatic symptoms. It evaluates an individual's level of anxiety symptoms and is validated and reliable in Turkish. The BAI consists of 21 multiple-choice questions that cover a range of anxiety symptoms, from restlessness to heart palpitations and sweating. Each item is rated on a scale from 0 to 3. The total score provides a measure of anxiety severity, which can be classified as minimal, mild, moderate, or severe. The BAI is a valid and reliable measure for evaluating anxiety levels over the previous week and is utilized in clinical practice and research. It aids in the diagnosis and treatment of anxiety disorders.[13]

New York Posture Rating Scale (NYPRS): This scale was used to assess the postures of the study participants. The Turkish validity and reliability study of the scale is available. This grading system assesses posture in thirteen different body parts. Five points were awarded for good posture, three points for moderate impairment, and one point for

Table1. Demographic information

Demographic factor	Mean±SD (n=118)
Age (years)	22.1±3.92
Height (cm)	170±10.27
Weight (kg)	68.8±17.25
BMI (kg/m^2)	24.4±3.56
Gender (n)	
Female	68
Male	50

SD: Standard deviation, BMI: Body mass index

severe impairment. The test evaluation yields a maximum score of 65 and a minimum score of 13. The test's standard evaluation criteria were as follows: "very good" if the total score was greater than 45, "good" if it was between 40 and 44, "fair" if it was between 30 and 39, "poor" if it was between 20 and 29, and "very poor" if it was less than 19.[14]

Statistical Analysis

The collected data were analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). In this study, correlation analysis was employed to examine the relationships between several relevant variables, including the participants' levels of physical activity, posture indices, anxiety ratings, and nomophobia. The normality of distributions was assessed using the Kolmogorov-Smirnov test, and it was observed that the distributions were normal. In parallel, pairwise comparisons were analyzed using the Independent Samples t-test, which is part of the parametric test group, and multiple comparisons were analyzed with the one-way Analysis of Variance (ANOVA) test. Pearson's or Spearman's correlation coefficients were computed to assess the strength and direction of the correlations between these variables.

A significance threshold of $p<0.05$ was established to determine the statistical significance of the observed relationships. The use of SPSS enabled a thorough analysis and evaluation of the relationships between the study's variables, producing noteworthy insights. The utilization of SPSS facilitated an extensive examination and interpretation of the associations among the variables under study, resulting in a significant understanding of the interplay between nomophobia, posture, anxiety, and physical activity within the study cohort.

Results

The study initially included 125 participants. Five individuals were excluded for not meeting the inclusion criteria, and two were excluded due to incorrect or incomplete form submissions. In total, 118 participants successfully completed the study.

Table 2. Questionnaire results

	Mean±SD
New York posture rating scale	58.88±5.20
Pittsburgh sleep quality index	7.61±3.41
Beck anxiety inventory	11.79±8.46
International physical activity questionnaire	
Walking	1972.54±1930.03
Middle activity	437.80±845.76
Heavy activity	814.92±1666.42
Total score	3353.23±2882.96
Nomophobia scale	
Total score	77.28±25.90
Number of participants (n=118)	
Never	0
Mild	23
Moderate	75
High	20

The demographic characteristics of the participants are presented in Table 1. The average age of the participants was 22.1±3.92 years, with an average height of 170±10.27 centimeters and an average weight of 68.8±17.25 kg. The calculated Body Mass Index (BMI) was 24.4±3.56 kg/m^2. The study cohort consisted of 68 female and 50 male participants.

The questionnaire results of the participants are shown in Table 2. The participants' posture assessment, determined using the New York Posture Rating Scale (NYPRS), yielded a mean score of 58.88±5.20. The average score on the Pittsburgh Sleep Quality Index (PSQI), which measures sleep quality, was 7.61±3.41. The average anxiety score on the Beck Anxiety Inventory (BAI) was 11.79±8.46.

The levels of physical activity among participants, as determined by the International Physical Activity Questionnaire (IPAQ), were as follows: The mean score for walking activity was 1972.54±1930.03 MET min/week, for moderate activity was 437.80±845.76 MET min/week, and for vigorous activity was 814.92±1666.42 MET min/week. The mean score for overall physical activity was 3353.23±2882.9 MET min/week. The participants' general physical activity levels were deemed adequate for health.

Furthermore, the Nomophobia Questionnaire (NMP-Q), which assessed the individuals' degrees of nomophobia, revealed an average overall score of 77.28±25.90. There was a moderate correlation between the BAI and NMP-Q scores ($r=0.306$; $p\leq0.05$) and a positive correlation between the BAI and PSQI scores ($r=0.356$; $p<0.001$). No significant correlations were found between the other variables ($p\geq0.05$).

Discussion

In this study, we investigated the interactions among university students' levels of physical activity, posture, anxiety, and nomophobia. Our aim was to elucidate the complex relationships between these variables and their effects on one another. According to our findings, there is a modest correlation between anxiety and sleep quality. This result highlights the importance of considering anxiety as a contributing factor to sleep-related issues. Additionally, our research indicates a moderate relationship between anxiety and nomophobia, underscoring the link between anxiety and mental health issues related to mobile phone use. This implies that individuals who are more anxious may also be more prone to experiencing nomophobia. Identifying and addressing these relationships is crucial for creating comprehensive mental health interventions and strategies tailored to college students. However, our research found no significant association between posture index scores and the level of physical activity. The fact that our study group was young and exhibited an adequate level of physical activity might influence the outcomes related to posture index and physical activity in the context of nomophobia. This also suggests that various lifestyle factors among university students may contribute to these results.

In reviewing the literature on nomophobia levels and demographic characteristics, Jahrami et al.[15] found no relationship between age, gender, BMI, and phone screen size with NMP-Q scores. Another study indicated that younger age groups are more susceptible to nomophobia, aligning with our study's young participant group, where most individuals exhibited moderate levels of nomophobic characteristics.[16]

Consistently, studies have identified a relationship between nomophobia and psychological factors. Kuşcu et al.[3] found a link between anxiety, hyperactivity, and nomophobia in adolescents. In their study assessing anxiety levels with BAI in relation to nomophobia levels in healthy young individuals, an increase in nomophobia scores corresponded to increased anxiety levels in the male group, while such a relationship was not observed in the female group.[17] Another study reported that increased problematic smartphone usage could lead to psychological issues.[18] Similarly, in our study, a relationship between anxiety scores and nomophobia levels was identified. This suggests that increasing dependency on phone usage might be associated with higher levels of anxiety.

Many studies have reported that phone addiction leads to low sleep quality.[19,20] One study identified strong relationships between nomophobia and sleep disorders, yet the clear elucidation of the relationship between these two disorders remains indistinct.[21] Additionally, it has been established that nomophobia and anxiety are associated with measurements of insomnia, emphasizing this aspect.[9] Jahrami et al.[22] reported a statistically significant relationship between nomophobia and insomnia. In another study, Ibrahim et al.[23] found a relationship between sleep quality scores and cell phone addiction among medical students, indicating its negative impact on their academic achievements. The findings of this study suggest that nomophobia is associated with sleep quality, and the escalation of phone addiction may lead to a deterioration in general health, potentially impacting academic performance among health students. Thus, intervention aimed at reducing phone addiction appears crucial.

In a study by AlMarzooqi et al.[9] examining the impact of nomophobia symptoms on e-sports players' insomnia, anxiety, and physical activity levels, it was reported that nomophobia is associated with anxiety and insomnia symptoms, but no significant relationship was found between nomophobia and levels of physical activity. However, in contrast, a study conducted on healthcare professionals reported a strong correlation between anxiety, physical activity, and nomophobia levels.[24] Among female university students in China, nomophobia was found to reduce physical activity through the time spent on outdoor activities.[25] In our study, we did not find a significant relationship between nomophobia and the level of physical activity. Nevertheless, when individuals use their phones as fitness accessories, it suggests that nomophobia might increase with physical activity.

Studies investigating the impact of phone usage on musculoskeletal problems have been conducted. Additionally, it has been reported that prolonged phone use can lead to various posture problems.[26,27] Ahmed et al.[26] examined neck problems in university students with the Neck Disability Index and found that it was associated with nomophobia. In contrast to our study, the relationship between nomophobia and posture conditions was not found. This may have reduced the effect of neck scores on general posture results. In addition, nomophobia did not affect general posture as a result of the younger group of participants in our study. We think that the increase in time spent in front of the phone at later ages may lead to posture disorders and may be effective on nomophobia. It may also lead to musculoskeletal system problems. Given the findings of our study and recent available evidence, further studies are needed to investigate the effects on phone addiction associated with physical activity.

Our research underscores the necessity of a holistic approach to the well-being of university students. Addressing nomophobia, anxiety, posture, and physical activity collectively can yield positive outcomes for both physical and mental health. Future research and interventions should consider these factors together to develop comprehensive strategies aimed at promoting the well-being of university students. This study serves as a foundational step for further research and targeted interventions aiming to enhance the overall health and well-being of this population.

Conclusion

This study illuminates the impact of increased cell phone use on anxiety, sleep quality, physical activity, and posture among university students. The results reveal a significant association between the level of nomophobia and both anxiety and sleep quality. However, no correlation was identified between nomophobia and physical activity levels or posture. Based on these findings, we believe that future research should focus on developing intervention methods to address and potentially prevent this escalating public issue.

Disclosures

Peer-review: Externally peer-reviewed.

Conflict of Interest: All authors declared no conflict of interest.

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Ethics Committee Approval: The study was approved by the İstanbul Medipol University Non-Interventional Clinical Research Ethics Committee (no: E-10840098-772.02-6790, date: 10/11/2022).

Authorship Contributions: Concept – G.D.; Design – H.G.; Supervision – G.D.; Funding – H.G.; Materials – G.D.; Data collection and/or processing – H.G.; Data analysis and/or interpretation – G.D.; Literature search – H.G.; Writing – H.G.; Critical review – G.D., H.G.

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