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RESEARCH ARTICLE

Comparison of Sleep Quality and Sleepiness in University Students with Different Levels of Nomophobia

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Abstract

Sleep is an important need for the maintenance of activities of daily living. With the development of technology, different types of technology addiction have emerged and it has been seen that these addictions affect sleep negatively. Nomophobia, which can negatively affect sleep, is one of these types of technology addiction and is often observed in university students. The study was planned to compare sleepiness and sleep quality in university students with different types of nomophobia. A total of 215 participants aged 18-25 enrolled to the study. Participants divided into three-groups mild nomophobia (n=67), moderate nomophobia (n=105) and severe nomophobia (n=43) according to Nomophobia Questionnaire results. Nomophobia Questionnaire, Epworth Sleepiness Scale and Pittsburgh Sleep Quality Index were used the study. A significant difference was determined between the severe nomophobic participants and the moderate and mild nomophobic participants in terms of sleepiness level and sleep duration ($p<0.05$). While sleep quality scores indicate possible sleep problems for all university students, no statistically significant difference was found in terms of different level of nomophobia groups ($p>0.05$). This study has shown nomophobia is quite common among university students, and sleepiness and sleep quality are negatively influenced by different levels of university students with nomophobia. Sleepiness is affected more negatively in university students with severely nomophobia compared to other groups. The health care providers should consider nomophobia level of university students as a confounding factor for sleepiness of university students.

Keywords
Sleep; Sleepiness; Sleep Quality; Nomophobia, University Students

INTRODUCTION

Sleep plays an important role in maintaining healthy activities of daily living. In addition, sleep is important in maintaining physical, cognitive and psychosocial health (Lund, Reider, Whiting & Prichard, 2010). Therefore, decreased sleep quality and increased sleepiness are indicated to cause potentially serious health problems (El Hangouche et al., 2018). On the other hand, authors emphasised that decreased sleep quality and increased sleepiness level were observed frequently in university students (Abo-Jedi, 2018; Peltzer & Pengpid, 2015). Various risk factors such as unhealthy living habits, nomophobia, and lack of social support have been identified as a relation to sleep problems among university students (Peltzer & Pengpid, 2015). With the advancement of technology and its acquisition of important places in daily life, different technology addictions or fear of staying away from technology have emerged, especially among university students. Also, these addictions cause sleep problems. For example, the rapid spread of the internet and smart phones can cause nomophobia in university students and this can lead to sleep problems (Torpil, Ünsal, Yıldız & Pekçetin, 2021; Li, Mei & Niu, 2006).

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Lately, smartphones and internet had become a daily necessity for most people and penetrate many aspects of activities of daily living due to their ease of access to workplace apps, social networks, information, healthcare, and entertainment (Oviedo-Trespalacios et al., 2019).
Nomophobia (no mobile phone phobia) which firstly introduced in the United Kingdom consists of the fear of living without a cell phone, smartphone, or internet (King, Valenca & Nardi, 2010; King et al., 2013; King et al., 2014). The term nomophobia associated with modern phobia has been pointed out as controversial, but it has also been stated as addiction to mobile phones or addiction to these devices (Rodríguez García et al., 2020;Gonçalves, Dias & Correia, 2020). Nomophobia is particularly common in university students (Rodríguez García et al., 2020).
In a study on nomophobia, researchers stated that nomophobia negatively influenced university students in many ways, such as psychosocial problems such as stress, depression, avoidance or hostility, obsessiveness, mindfulness, loneliness, academic performance problems, and insomnia problems (Rodríguez García et al., 2020). It has been determined that nomophobia causes occupational-performance problems in university students (Rodríguez García et al., 2020). Authors determined that participants have problems in many occupations such as sleeping, studying, doing sports, meeting friends (Rodríguez García et al., 2020). On the other hands, higher levels of nomophobia among university students have been significantly associated with more daytime sleepiness and more behaviors associated with poor sleep quality and sleepiness (Khayat et al., 2018; Kim & Min, 2020; Li, Mei & Niu, 2006; Peszka et al., 2020). In addition, the relationship between nomophobia and health conditions such as sleep quality, sleep disturbance, sleepiness, impaired short-term memory, dizziness, and high blood pressure, interpersonal sensitivity, obsession-compulsion and depression is worrisome (Davoudi, Manshaee & Golparvar, 2020; Gonçalves, Dias &Correia; 2020). However, no comparison was found between sleep quality and sleepiness in university students with different levels of nomophobia in the literature, and it was also stated that nomophobia and sleep-related parameters should be investigated more extensively in a systematic review study (Rodríguez García et al., 2020). The study was created to comparison of the sleepiness and the sleep quality of university students with nomophobia at different levels.

MATERIALS AND METHODS

The current study was conducted in public university faculty of health sciences students between February and March 2021

Participants

University students were invited to the present study in which convenience sampling method was used.

Inclusion criteria: (1) between the ages of 18-25; (2) owning a smart phone; (3) being nomophobic according to the Turkish Nomophobia Questionnaire; and (4) understanding verbal instructions. Exclusion criteria: (1) having any diagnosed psychiatric disease; (2) having a sleep disorder and (3) not completing the assessment.

For the current study, a sample size calculation based on error margin of 5%, 95% confidence level for a population of 900 students, and expected ratio of PTSD of 50% was run at the samplesizecalculatorwebsite:http://www.raosoft.com/samplesize.html and the result was found to be 270. From these students 49 were excluded because they did not complete the assessment and 6 were excluded due to presence of a psychiatric disease. As a result, the current study was completed with 215 participants.

Measurement

Demographic information of the participants such as age, gender, daily smart-phone usage time, and have any psychiatric or sleep disorders were obtained. The study protocol was carried out in accordance with the Helsinki Declaration of 1975 and an approval was obtained from the University of Health Sciences, Scientific Research Ethics Committee, Turkey (Ref: Go 2021/514). Written informed consent forms were obtained from all participants prior to the study. Written informed consent to participate in this study was provided by the participants.

Assessments

1-Nomophobia Questionnaire (NMP-Q)

The Turkish NMP-Q was used both in the inclusion criteria and in determining the nomophobia levels of the participants. The NMP-Q consists of 20-items rated with a 7-point Liker type (18). NMP-Q scores are interpreted as 20 points none,21-59 points mild,60-99 points

moderate, and 100-140 severe (Yildirim & Correia, 2015). The Cronbach's alpha coefficient reliability of the NMP-Q is 0.95 and the Turkish version of the NMP-Q is 0.92. (Yildirim et al., 2016).

2- The Epworth Sleepiness Scale (ESS

The Turkish ESS is a self-administered questionnaire designed to measure the overall level of daytime sleepiness (Johns, 1991). Participants rate their probability of falling asleep between 0 and 3 in 8-different situations that are frequently encountered in activities of daily living. The ESS is scored between 0-24. Higher scores on the scale indicate sleepiness (Johns, 1991). Scores between 0-9 are considered normal, while scores between 10-24 mean excessive sleepiness (Johns, 1991). The Turkish reliability and validity of the scale was made by Izci et al (Cronbach's a= 0.87) (Izci et al., 2008).

3- The Pittsburgh Sleep Quality Index (PSQI)

The Turkish PSQI was assessed to sleep quality. The PSQI consists of 18 items consisting of 7 components in a 1-month period. These items are scored on a 4-point Likert scale. The PSQI is scored out of 21 points and a score of 5 and above indicates poor sleep quality.

The PSQI was developed by Buysse et al. (1989) and adapted into Turkish version by Ağargun et al (1996). The Cronbach's alpha value for the Turkish-PSQI was 0.81.

Statistical Analyses

Data were analysed with the IBM SPSS Statistics version 25.0 statistical software package program. Data are showed as mean±standard deviation. Differences between groups were analyzed with chi square test for nominal data. Normality of data distributions was analyzed with the Shapiro Wilks test. Data were not normally. distributed. Differences between the groups were analyzed with the Kruskal–Wallis test. P values were adjusted using Bonferroni correction for multiple tests when appropriate. Level of significance was 0.05.

RESULTS

Participants were divided into 3 different levels (mild (n=67, 31.16%); moderate (n=105, 48.83%); and severely nomophobia (n=43, 20.00%)) of nomophobia according to the Turkish NMP-Q scale. The groups were comparable in terms of gender and age (p>0.05). There were statistically differences in daily smartphone usage time between groups (p<0.05). University students with severe nomophobia had more daily smartphone usage duration when compared with other nomophobia groups. Demographic data of the groups are shown in Table 1.

Table 1. Demographic characteristics of participants

	Mild Nomophobia (n=67)		**Moderate Nomophobia (n=105)**		**Severe Nomophobia (n=43)**		
Sex	**n**	**%**	**n**	**%**	**n**	**%**	**p**
Female	59	88.1	94	89.5	41	95.3	>0.05
Male	8	11.9	11	10.5	2	4.7	>0.05
	Mean±SD		**Mean±SD**		**Mean±SD**		
Age (years)	20.2±2.4		20.0±1.3		19.8±1.1		>0.05
Daily smartphone usage (hours)	5.38±2.47		5.80±2.17		6.58±2.34		**<0.05**

SD: standart deviation

There were statistically significant differences in sleepiness scores between the groups (p<0.05). Bonferroni post-hoc analysis results indicated that ESS scores were significantly higher in the university students with severe nomophobia when compared with the mild and moderate groups (p<0.05). The groups were similar in all subheadings of PSQI (p>0.05) (Table 2).

Table 2. Comparisons of PSQI and ESS scores according to different levels of nomophobia

	Mild Nomophobia	**Moderate Nomophobia**	**Severe Nomophobia**	p
PSQI	M± SD	M± SD	M± SD	
Subjective sleep quality	1.02±0.90	1.10±0.91	1.02±0.83	>0.05
Sleep latency	1.56±0.92	1.67±1.05	1.53±0.98	>0.05
Sleep duration	0.40±0.57	0.40±0.58	0.30±0.51	>0.05
Habitual sleep efficiency	0.19±0.49	0.15±0.43	0.23±0.47	>0.05
Sleep disturbances	1.56±0.67	1.44±0.57	1.48±0.50	>0.05
Use of medications for sleep	1.26±0.66	1.29±0.70	1.11±0.66	>0.05
Daytime dysfunction	062±0.64	0.68±0.52	0.72±0.54	>0.05
Total	6.65±2.72	6.76±2.95	6.41±2.91	>0.05
ESS	5.25±3.79	6.09±4.31	6.81±3.54	**<0.05***

M: Mean, SD: standart deviation PSQI, Pittsburgh Sleep Quality Index; ESS, Epworth Sleepiness Scale

DISCUSSION

In the our study was carried out to comparison of the sleepiness and sleep quality levels of university students with different nomophobia levels. According to the findings of the present study, our findings stated that participants with severe nomophobia had worse sleepiness levels compared to other groups. In addition, our findings showed that participants with severe nomophobia had more smartphones usage times than other students with nomophobia. While the sleep quality score means of the university students with nomophobia indicate a possible sleep problem, no difference was found between the sleep quality of different levels of university students with nomophobia.

Researchers emphasised that university students suffer from sleep disorders which caused poor sleep quality and high sleepiness (Levenson et al., 2016). Previous studies have shown that smartphone addiction negatively affects sleep (Kim, Min & Park, 2019; Li, Mei & Niu, 2006). Similarly, the researchers showed that the increment in duration of smartphone use in university students lead decrement in sleep quality (Özkaya et al., 2020). The researchers determined that sleep is one of the most important problems in activities of daily living of university students with nomophobia (Li, Mei & Niu, 2006; Torpil, Ünsal, Yıldız & Pekçetin, 2021). The literature suggests a connection between nomophobia, daytime sleepiness and sleep quality (Kim, Min & Park, 2019; King et al., 2014; Torpil, Ünsal, Yıldız & Pekçetin, 2021). In the our study, it was showed that participants with nomophobia had problems

The current study was conducted to comparison of the sleepiness and sleep quality with sleepiness and sleep quality. When the groups were compared, it was found that university students with severely nomophobia had worse sleepiness than other groups. This may be due to the fact that university students with severely nomophobia have a longer duration of smartphone use compared to other groups, negatively affecting sleep. On the other hand, factors such as increased exposure to smartphones due to the Covid-19 pandemic and increased duration of stay at home due to various restrictions may also be effective. We think that it will be important to develop rehabilitation approaches to prevent sleepiness and increase sleep quality in university students with nomophobia. It may be important to determine whether there is nomophobia in studies on sleep problems in university students. Further studies should study the effect of the Covid-19 pandemic on the nomophobia and sleep.

In systematic review on nomophobia, it has been observed that university students have different types of nomophobia, and this rate constitutes at least half of the students or more (Rodríguez García et al., 2020). Authors have found 17.9% had mild Nomophobia, 60% moderate and 22.1% severe Nomophobia of the total of 145 students (Farooqui, Pore & Gothankar, 2018). Another study on nomophobia, it has been determined that university students have 30.9% mild, 52.5% moderate and 16.6% severe nomophobia (Torpil, Ünsal, Yıldız & Pekçetin, 2021). In the current study, 215 participants, nomophobia scores indicate mild nomophobia at least, which revealed the importance of drawing

attention to this problem. Although the current study sample was relatively small, findings of the study were consistent with the current literature, suggesting that nomophobia is a common public health problem. Therefore, health professionals should work on the rehabilitation of nomophobia. In addition, due to the measures and restrictions during the Covid-19 pandemic process, situations such as education and social communication may increase the need for smartphones, and considering this situation, the level of nomophobia may be negatively affected. For this reason, we think that it will be important to investigate the effect of pandemic process on technology addiction such as nomophobia.

The current study has some limitations. First, small sample size required careful interpretation of findings. Second limitations of the current study are that the students participating in the study did not include university students without nomophobia and that no comparison was made. Another limitation is that has various problems may affect sleep and that should be evaluated detailly in the future research. In the current study is important in terms of revealing the problem, but the sleep assessment scales are self-reported questionnaire, so that studies that include more objective methods such as wearable devices are needed for a better understanding of the subject.

Conclusion

Nomophobia is seen quite common among university students and may influence students' daytime sleepiness and sleep quality problems. The findings showed that university students with severe nomophobia used smartphones more frequently than students with other nomophobia levels, and also the findings showed that the level of sleepiness was worse in university students with severe nomophobia. It should not be forgotten that sleep problems and nomophobia are important public health problems and may influence each other. The health care providers keep in mind nomophobia may influence sleep quality and sleepiness. This study had some limitations. Not knowing the nomophobia levels of the participants before the pandemic created a limitation in the interpretation of the results. Further studies should investigate the impact of rehabilitation approaches for nomophobia on sleep quality and sleepiness.

Acknowledment

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Conflict of interests

There is no conflict of interest in the present study.

Ethical Consideration

The study protocol was carried out in accordance with the Helsinki Declaration of 1975 and an approval was obtained from the University of Health Sciences, Scientific Research Ethics Committee, Turkey (Ref: Go 2021/514). Written informed consent forms were obtained from all participants prior to the study.

Author Contributions

Study Design, BT, SP; Data Collection, BT, GGY, ZBA, SP; Statistical Analysis, BT, SP; Data Interpretation, BT, GGY, ZBA, SP; Manuscript Preparation, BT, GGY, ZBA, SP; Literature Search, BT, GGY, ZBA, SP. All authors have read and agreed to the published version of the manuscript

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