Determining Nomophobia and Netlessphobia Levels in Gifted and Talented Children

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ABSTRACT. The aim of this study is to determine the levels of nomophobia and netlessphobia in gifted and talented children. The variables of nomophobia and netlessphobia are strongly and positively correlated, r(106) = .63, p < .01. According to the ordinal logistic regression analysis, girls are 4.25 times more likely to experience nomophobia than boys (OR = 4.25, 95% CI [0.65, 2.25]). Additionally, gifted adolescents whose mothers are permanently employed are 2.62 times more likely to experience nomophobia than those whose mothers are not employed in a permanent job (OR = 2.62, 95% CI [0.16, 1.77]). Exposure to electromagnetic waves is believed to potentially cause hearing problems, brain stimulation effects, and even brain tumors. The strong correlation between nomophobia and netlessphobia highlights the risks associated with excessive digital device use. Considering the potential psychological and physiological effects, interventions that promote responsible technology use are essential.

Keywords: Nomophobia; netlessphobia; gifted and talented children.

Introduction

The internet and mobile phones, two of the most essential innovations of the technological age, play a significant role in people's lives and appeal to individuals of all ages, particularly young people (Kadan, 2023). However, despite these advantages, they may also lead to a variety of health-related concerns, including hostility, introversion, addiction to virtual environments, and increased tendencies toward violence (Çakır & Oğuz, 2017). A growing body of research suggests that tools designed to make life easier can also contribute to serious behavioral addictions (Allcott et al., 2022).

Smartphones have become indispensable in entertainment, healthcare, and education. However, their careless or excessive use can negatively impact daily functioning. The compulsive use of smartphones, often perceived as a necessity, has been shown to result in physical, behavioral, and psychological problems in young individuals (Çakır & Oğuz, 2017). Moreover, frequent exposure to technological devices especially among children who model their behavior after their parents can lead to emotional and behavioral disorders (Akça & Çilekciler, 2019). As a result, technology addiction is increasingly common within this age group (Van Endert, 2021).

The use of the internet has been linked to a rise in technology addiction. Although increased internet access facilitates daily life (Öztürk, 2015), the diminishing perception of time has been shown to contribute to addictive behaviors (Arı, 2022). One such behavior is nomophobia, a modern-day phobia characterized by anxiety or panic when an individual is unable to access their mobile device (Gürol et al., 2020). According to Spitzer (2015), nomophobia has been associated with various mental health issues, including sleep disorders, loneliness, addiction, depression, personality disorders, aggression, and attention deficit hyperactivity disorder (Spitzer, 2015). Furthermore, the integration of mobile phones into daily life has given rise to several concerns. Mobile phones were introduced in Turkey in the mid-1990s, and their usage increased rapidly within a few years. Over the past two decades, the exposure to radiofrequency (RF) waves emitted by mobile devices has grown significantly, sparking debates over the potential health risks associated with electromagnetic fields (EMFs). Research suggests that RF waves from mobile phones may adversely affect the neuroendocrine system (Irmak et al., 2002). Additionally, technology addiction can have negative social

consequences, particularly for gifted children, potentially leading to social isolation, communication difficulties, and increased susceptibility to misinformation (Sucu, 2012).

As a result, understanding gifted and talented children and supporting their integration into society is essential for unlocking their creative potential and contributing to societal advancement. In this context, the present study aims to determine the levels of nomophobia and netlessphobia among gifted and talented children.

Material and methods

Objective and method

This descriptive study aimed to investigate the levels of nomophobia and netlessphobia among gifted and talented children.

Population and sample

In this study, the population consisted of gifted and talented students (N = 250) who were eligible to attend the Hatay Science and Art Center an institution for special education affiliated with the Ministry of National Education of the Republic of Turkey during the 2021–2022 academic year, at the 5th through 8th grade levels. A purposive sampling method was used, initially including all middle school students in the research. However, students who did not fully complete the survey or who chose not to participate were excluded from the analysis. As a result, the study was conducted with a final sample of 108 students.

Data collection tools

The data for this study were collected using a researcher-developed questionnaire (Van Endert, 2021; Gül, 2023; Argumosa-Villar et al., 2017), in addition to the Nomophobia Questionnaire (NMP-Q) and the Internet Addiction Scale.

Nomophobia Scale (NMP-Q): Within the scope of this study, the 20-item Nomophobia Questionnaire (NMP-Q), developed by Yildirim and Correia (2015), was used to assess individuals' levels of smartphone addiction. The scale includes four sub-dimensions capturing various aspects of nomophobic behavior: (i) inability to access information, (ii) loss of convenience, (iii) inability to communicate, and (iv) fear of losing internet connectivity.

Internet addiction (Netlessphobia) scale: The Internet Addiction Scale was developed by Günüç and Kayri in 2010 (Günüç & Kayri, 2010). It consists of 29 items across four subscales: Deprivation, Control Difficulty, Impairment in Functionality, and Social Isolation. The scale is designed to measure various dimensions of internet addiction. The internal consistency coefficient (Cronbach's alpha) was calculated as .944, indicating high reliability. Scores on the scale range from a minimum of 35 to a maximum of 175. Individuals with total scores above the established threshold are considered addicted or at risk of addiction, whereas those with scores below the threshold are classified as not addicted.

Analysis

Data were analyzed using the SPSS statistical software package, with the Kolmogorov–Smirnov test employed to assess the normality of the data distribution. Descriptive statistics, including frequencies, percentages, and the Chi-square/Fisher's exact tests, were used to analyze participants' socio-demographic characteristics, while Harman's Single Factor test was conducted to evaluate potential common method variance. Scale reliability was assessed using Cronbach's alpha coefficient ($\alpha \geq .70$). Correlation analysis was performed to examine the relationships between variables. To identify factors influencing nomophobia levels among gifted and talented children, an ordinal logistic regression analysis was conducted. Variables affecting netlessphobia levels were examined using binary logistic regression analysis.

Ethics committee

Ethical approval for this study was obtained from the Scientific Research and Publication Ethics Committee for Social and Human Sciences at a university (Decision No: 06/12/2021–15). Written permission was also obtained from the institution where the research was conducted (Document No: 81576613-10.06.02-E.1563890, dated 21/01/2020 – 2020/2). In addition, informed consent was obtained from all participants, and the research was conducted in accordance with the principles outlined in the Declaration of Helsinki.

Results

Test of harman single factor

Since the variables in this study were measured through self-report, the associations between them may have been subject to common method bias (Podsakoff et al., 2003). To address this concern, the Harman's Single Factor Test (non-rotated exploratory factor analysis) was applied using the netlessphobia and nomophobia measures to assess the potential for common method variance. The analysis identified five distinct factors with eigenvalues greater than 1. Additionally, the total variance explained by a single factor was 46%, which is below the critical threshold of 50%, indicating that common method bias was not a significant issue in this study.

Descriptive statistics for the sample

57.4% of the sample is male and 42.6% is female, and their gender distribution does not differ according to the school they attend, X^2 (1, N = 108) = .47, p = .49. The sample consisted of 40 students in the 5th grade, 31 in the 6th grade, 28 in the 7th grade and 9 in the 8th grade. Class distributions of the sample are significantly different depending on the school they attend, X^2 (3, N = 108) = 12.5, p = .01. The family type of the majority of the sample (93.5%) is nucleus, and there is a significant difference between those who attend private schools and those who attend public schools: X^2 (1, N = 108) = 10.0, p = .01. While the median age of participants attending private schools is 12 (Mdn = 12), the median age of participants attending public schools is 11 (Mdn = 11). There is no difference between the groups in terms of mean age (U = 1197.50, p = .50) (Table 1). Fifty percent of participants use smartphones, while fifteen percent carry a charger daily. 38% of the participants use their mobile phones for less than 1 hour a day. There is no significant difference between the participants who went to private school and the participants who went to public school in terms of the technological device used, smartphone usage time and having a charger, p > .05. 56.5% of the students show netlessphobia addiction, p > .05. Nomophobia levels are respectively 56.5% at the mild level, 31.5% at the moderate level and 12.0% at the extreme addiction level. Children's nomophobia addiction levels differ significantly depending on the school they attend, X^2 (2, N = 108) = 14.89, p = .01, (Table 1)

Table 1. Descriptive Statistics for Study Variables of Students.

		All participants	Attend private school	Attend public school	P value for (Attend private and public school)
		Mean, SD			
	Age	11,9 ± 3,9	12,2 ± 4,76	11,8 ± 3,7	p = .5
		n, %			
		Socio-demographic Factors			
Gender	Female	46 (42.6%)	17	29	p = .49
	Male	62 (57.4%)	19	43	
Grade	Grade 5	40 (37,0%)	15	25	p = .01 (Fisher exact test)
	Grade 6	31 (28,7%)	5	26	
	Grade 7	28 (25,9%)	9	19	
	Grade 8	9 (8,3%)	7	2	
Family type	Nucleus	101 (93,5 %)	30	71	p = .01 (Fisher exact test)
	Large	4 (3,7%)	4	0	
	Single parent family	3 (2,8%)	2	1	
Mother's working status	Works in a permanent job	59 (%54.6)	25 (%69.4)	34 (%47.2)	p = .03
	Not working in a permanent job	49 (45.4)	11 (%30.6)	38 (%52.8)	
Father's working status	Works in a permanent job	105 (%97.2)	36 (%100.0)	69 (%95.8)	p = .55 (Fisher exact test)
	Not working in a permanent job	3 (%2.8)	0 (%0.0)	3 (%4.2)	
		Factors Related to Technology Use			
Digital devices owned	Smart phone	54 (50.0%)	21 (58.3%)	33 (45.8%)	p = .47
	Desktop computer	26 (24.1%)	7 (19.4%)	19 (26.4%)	
	Tablet	28 (25.9%)	8 (22.2%)	20 (27.8%)	
Keeping a charger with you	Yes	15 (13.9%)	5 (33.3%)	10 (33.3%)	p = .10
	No	93 (86.1%)	31(66.7%)	62 (66.7%)	

Daily mobile phone usage time	Less than 1 hour	41 (%38.0)	14 (%38.9)	27 (%37.5)	
	1-3 hours	49 (%45.4)	15 (%41.7)	34 (%47.2)	p = .91
	3-5 hours	11 (%10.2)	4 (%11.1)	7 (%9.7)	
	More than 5 hour	7 (%6.5)	3 (%8.3)	4 (%5.6)	
		Netlesphobia and Nomophobia Levels			
Netlesphobia	Addicted	61 (%56.5)	21 (%58.3)	40 (%55.6)	p = .78
	Not Addicted	47 (%43.5)	15 (%41.7)	32 (%44.4)	
Nomophobia	Light	61 (%56.5)	20 (%55.6)	41 (%56.9)	
	Middle	34 (%31.5)	6 (%16.7)	28 (%38.9)	p = .01
	Over	13 (%12.0)	10 (%27.8)	3 (%4.2)	

Mean, standard deviation, and reliability results for the relationship between variables.

The internal consistency coefficient for the Netlessphobia Scale was found to be α = .97. The reliability coefficients for its sub-dimensions were as follows: Deprivation (α = .92), Control Difficulty (α = .92), Functional Impairment (α = .93), and Social Isolation (α = .91). Similarly, the Nomophobia Scale demonstrated high reliability, with an overall internal consistency coefficient of α = .95. The reliability coefficients for its sub-dimensions were: Inability to Access Information (α = .87), Loss of Comfort (α = .82), Inability to Communicate (α = .92), and Fear of Losing Online Connection (α = .89). The relationship between netlessphobia and nomophobia was analyzed using Spearman's correlation analysis (Table 2). A strong positive correlation was found between the two variables, r(106) = .63, p < .01.

Table 2. Mean, Standard Deviation, and Reliability Results for the Relationship Between Variables.

Variables	M(SD)	α	Netlesphobia (General)	x	y	z	t	Nomophobia (General)	a	b	c	d
Netlesphobia (General)	75.80 (29.7)	.97	-----									
x	27.6 (10.40)	.92	.93**	----								
y	21.27 (8.93)	.92	.94**	.83**	----							
z	14.22 (6.64)	.93	.90**	.76**	.84**	----						
t	12.78 (6.09)	.91	.84**	.68**	.75**	.76**	----					
Nomophobia (General)	61.22 (26.78)	.95	.63**	.70**	.54**	.46**	.47**	-----				
a	12.30 (6.27)	.87	.59**	.62**	.52**	.45**	.49**	.84**	---			
b	14.48 (7.31)	.82	.67**	.74**	.58**	.51**	.52**	.86**	.73**	---		
c	22.14 (9.95)	.92	.40**	.50**	.34**	.27**	.25*	.88**	.61**	.63**	---	
d	12.31 (6.93)	.89	.71**	.74**	.61**	.57**	.57**	.83**	.70**	.71**	.61**	---

*= The correlation is significant at the .01 level ** = The correlation is significant at the .05 level. x = Netlesphobia (Deprivation), y = Netlesphobia (Difficulty in control), z = Netlesphobia (Impairment in functionality), t = Netlesphobia (Social isolation) , a = Inability to access information, b = Don't give up on comfort, c = inability to communicate, d = Lose online connection

Variables influencing the level of nomophobia in gifted and talented children

A logit linked ordinal regression analysis was conducted to investigate the effect of gender and parental employment status variables on the nomophobia levels of gifted and talented children. Since the children's nomophobia levels were determined as mild (61), moderate (34) and extreme (13) during the analysis, the analysis was carried out on these three levels. Predictor variables were pretested to verify that the assumption of no multicollinearity was not violated. As a result of the analysis, it was found that the predictive variables (gender and maternal employment status) contributed to the model in the ordinal logistic regression analysis. Gender and maternal employment status variables explain 20% of the nomophobia addiction level, (p <.01) (Table 3).

According to ordinal logistic regression analysis, girls are 4.25 times more likely to experience nomophobia than boys (OR = 4.25, 95%CI [.65, 2.25]) Talented adolescents whose mothers are permanently employed are 2.62 times more likely to experience nomophobia than others (OR = 2.62, 95%CI [.16, 1.77]) (Table 4).

Table 3. Logit Linked Ordinal Regression Analysis Model Validity.

Model	-2 Log Likelihood	χ^2	sd	p
H_0 hypothesis	47.107			
Model	27,083	20,025	2	.01
Pseudo R^2:		Cox and Snell = .169, Nagelkerke = .200, McFadden = .098		
		Pearson: p = .458, Deviance: p = .318		

Table 4. Ordinal Logistic Regression Analysis Results According to the Nomophobia Levels of Gifted and Talented Children.

	Model				95% Confidence Interval		Reference Category
Nomophobia (0 = slight, 1 = mild, 2 = severe)	β	SE	p	OR[a]	Lower Bound	Upper Bound	
Slight Nomophobia	1.420	.376	.001				
Mild Nomophobia	3.409	.496	.001				
Female	1.449	.407	.001	4.25	.65	2.25	Male
Mother works at a job	.963	.411	.019	2.62	.16	1.77	The mother does not work at a job

Discussion

According to the findings of this study, which examined the levels of nomophobia and netlessphobia among gifted and talented children, more than half of the participants exhibited symptoms of nomophobia, and a comparable proportion showed signs of netlessphobia addiction. Additionally, nomophobia levels varied significantly depending on the type of school the children attended. Students enrolled in public schools demonstrated higher levels of nomophobia compared to those in private schools. This disparity may stem from individual characteristics or institutional policies concerning mobile phone usage. While smartphones and the internet are tools that facilitate daily life, their unconscious and excessive use has increasingly led to negative consequences. Smartphones, in particular, when excessively used or perceived as indispensable, have been linked to numerous physical, psychological, and behavioral problems (Chiu, 2014; Salehan & Negahban, 2013). Individuals struggling with self-confidence and identity may be more vulnerable to the addictive design of smartphone applications requiring constant interaction. These apps require users to remain frequently online and to continuously monitor and manage their devices, which can gradually lead to the development of addictive behaviors (Argumosa-Villar et al., 2017).

Nomophobia levels, particularly among high school students, may vary by gender. For instance, a study by Kumar et al. (2021) found that male students were more affected by nomophobia than females a result that was also supported by other research. Conversely, several studies have reported that female students are more prone to nomophobia compared to males (Buctot et al., 2020; Kuscu et al., 2021; Sagita & Santika, 2020). However, some studies have yielded contradictory results, indicating that male students experience higher levels of nomophobia (Amandeep et al., 2019). In contrast, the findings of the present study suggest that female students are more likely to experience nomophobia than their male peers. Nomophobia is closely associated with netlessphobia, as both are linked to problematic internet use. Studies conducted with adolescents have also shown that levels of nomophobia often parallel those of netlessphobia (Ayar & Bektas, 2021). The findings also indicate that nomophobia and netlessphobia levels closely align (see Table 1). The findings of this study suggest that gifted and talented children, like their peers, experience both nomophobia and netlessphobia. The consistency of these results with existing literature may be attributed to the fact that students within the same age group tend to use similar social communication platforms and engage with technology for comparable purposes and durations, both in educational settings and personal use. Additionally, previous research has shown no clear correlation between age and nomophobia (Argumosa-Villar et al., 2017; Hoşgör, 2020; Yıldız Durak, 2019). Although some studies have reported a positive relationship between younger age and higher nomophobia scores, the overall effect of age on nomophobia remains inconclusive due to inconsistent findings across studies (Argumosa-Villar et al., 2017). In this study, It was observed that 38% of the students used their mobile phones for less than an hour daily, whereas 62% reported usage exceeding one hour per day. Similarly, Durak and Seferoğlu (2018) found that approximately half of the students in their study used smartphones for less than an hour daily, and one-third checked their phones every 2 to 3 hours. In contrast, a study conducted in India revealed that individuals living in

metropolitan and urban areas tend to use their phones for more than five hours a day and are at a high risk of developing mobile phone addiction, commonly referred to as nomophobia. According to data from a research organization cited in the study, 58% of young participants in Mumbai reported that they could not go even a single day without using a mobile phone (Kumar et al., 2021; Macro, 2004; Vaidya et al., 2016). The students' levels of nomophobia categorized as mild, moderate, and extreme were determined based on their average scores across all items on the nomophobia scale. According to the findings, 56.5% of the students exhibited mild levels of nomophobia, 31.5% showed moderate levels, and 12.0% demonstrated extreme nomophobia. In comparison, a recent study conducted in India reported that 39.5% of students were nomophobic, while 27% were at risk of developing the condition, which is becoming increasingly common among young people (Pavithra & Madhukumar, 2015; Argumosa-Villar et al., 2017). In a study by Kumar et al. (2021), 18.9% of participants were found to have severe nomophobia, while 74.8% exhibited moderate levels (Kumar et al., 2021). Similarly, Semerci (2019) reported that the majority of students categorized within the smartphone addiction group demonstrated moderate nomophobia (Semerci, 2019). Supporting these findings, a study conducted in Turkey revealed that a significant proportion of young individuals exhibited moderate to high levels of nomophobia (Gurbuz & Ozkan, 2020). In a similar study, Durak and Seferoğlu (2018) reported that, based on the scores obtained from the smartphone addiction scale, more than half of the students were classified in the "addictive" group. Supporting this finding, Cabi and Alp (2020) also found that the majority of students were identified as smartphone addicts, based on the distribution frequencies derived from the scale score ranges (Durak & Seferoğlu, 2018; Cabi & Alp, 2020). Additionally, there are studies showing that all participants are addicted (Gürbüz and Özkan, 2020), slightly addicted and moderately addicted (Gürbüz and Özkan, 2020; Kumar et al., 2021). In the study, it was seen that there was a strong positive relationship between the variables of Netlesphobia and nomophobia. This result is similar to the results of studies conducted by Semerci (2019) and Yıldız Durak (2019) on the same age group, examining the relationship between netlesphobia and nomophobia. On the other hand, it has been determined that gender and school factors play an important role in netlesphobia. In this study, according to ordinal logistic regression analysis, girls are 4.25 times more likely to experience nomophobia than boys. Gifted adolescents whose mothers are constantly employed are 2.62 times more likely to experience nomophobia than others. Semerci (2019) reported that female students were less likely to be smartphone addicts than males, and that low-level nomophobics had a higher risk of addiction than those with moderate or high levels. In contrast, other studies found higher addiction rates among male students, which researchers linked to greater use of information technologies by males (Yıldız Durak, 2019; Durak & Seferoğlu, 2018). Long-term use of mobile devices reduces physical activity and weakens muscle strength. However, it has detrimental effects on both mental and physical health and can even lead to the development of cancer. According to a study by Anboucarassy and Begum (2014), excessive use of mobile phones had a small negative impact on secondary school students' mental health. Additionally, Naeem (2014) found that disrupted sleep patterns increased the risk of traffic accidents due to driver distraction, and that children face a higher risk of brain cancer than adults because of their developing nervous systems. The harmful effects of low-level electromagnetic radiation (LLER) emitted by mobile phones on the brain are well-documented, although not yet fully understood. However, scientific evidence has not yet been fully realized (Kiziltan, et al. 2014). It is known that mobile phones seriously affect human hormones and chemicals (Emad et al., 2011). LLER has various effects on the nervous system, as well as reducing sperm count and increasing brain tumours and DNA fragmentation (Salford et al., 2008; Hardell, et al., 2009; Luis, et al., 2009). Many of these effects are due to changes in hormonal profiles. In the study conducted by Kiziltan et al. (2014) to examine the effect of LLR waves on rats, a maximum temperature increase of 5 ^{0}F was obtained on the skin of the rat exposed to a single 45-minute LLR wave. It has been stated that it is not fully understood how these temperature differences on the skin affect body health. However, it is thought that these heat effects may cause some hearing and brain stimulation complaints and brain tumors. In addition to these findings in brain studies, it is recommended to conduct chemical and thermal research and separate studies to evaluate the effects on hearing and the ear (Kiziltan, et al. 2014).

Conclusion

This study highlights the high prevalence of nomophobia and netlessphobia among gifted and talented children, as well as the influence of gender and maternal employment status on addiction levels. Female students demonstrated higher levels of nomophobia than their male counterparts, while children whose

mothers held permanent employment were more likely to be affected. The strong positive correlation between nomophobia and netlessphobia underscores the potential risks posed by excessive digital device use. Given the potential psychological and physiological consequences, implementing interventions that encourage responsible and balanced technology use is crucial. Future studies should examine the long-term impacts of digital addiction on cognitive and social development, while also integrating chemical and thermal research to assess its effects on auditory and neurological functioning.

References

Akça, F., & Çilekçiler, N. K. (2019). Cartoon characters that pre-school children are most impressed with and the digital dangers that their identification with these characters may cause. *Addicta: The Turkish Journal on Addictions*, *6*(2), 403-433. https://doi.org/10.15805/addicta.2019.6.2.0053

Allcott, H., Gentzkow, M., & Song, L. (2022). Digital addiction. *American Economic Review*, *112*(7), 2424-2463. https://doi.org/10.1257/aer.2021086

Amandeep, S. M., & Jeenger Jitendra, D. M. M. (2019). Nomophobia and its relationship with depression, anxiety, and quality of life in adolescents. *Indian Journal of Psychiatry*, *28*(2), 231-236. https://doi.org/10.4103/ipj.ipj_60_18

Anboucarassy, B., & Begum, M. (2014). Effect of use of mobile phone on mental health of higher secondary school students. *Journal on Educational Psychology*, *8*(2), 15-19. http://www.imanagerpublications.com

Argumosa-Villar, L., Boada-Grau, J., & Vigil-Colet, A. (2017). Exploratory investigation of theoretical predictors of nomophobia using The Mobile Phone Involvement Questionnaire (MPIQ). *Journal of Adolescence*, *56*, 127–135. https://doi.org/10.1016/j.adolescence.2017.02.003

Arı, F. (2022). Post Internet Addiction: Netlessfobia and Virtualized Identity. *International Journal of Social Work Research*, *2*(1), 85-96. https://dergipark.org.tr/tr/pub/jswrpub/issue/66315/10176671

Ayar, D., & Bektas, M. (2021). The effect of problematic internet use and digital game addiction in adolescents on nomophobia levels. *International Journal of Caring Sciences*, *14*(2), 1081-1088. www.internationaljournalofcaringsciences.org

Buctot, D. B., Kim, N., & Kim, S. H. (2020). The role of nomophobia and smartphone addiction in the lifestyle profiles of junior and senior high school students in the Philippines. *Social Sciences & Humanities Open*, *2*(1), 2590-2911. https://doi.org/10.1016/j.sshao.2020.100035

Cabi, E., & Alp, D. (2020). A research on secondary school students' nomophobia levels. *Karaelmas Journal of Educational Sciences*, *8*, 149-159. https://dergipark.org.tr/en/download/article-file/2160976

Chiu, S. (2014). The relationship between life stress and smartphone addiction on taiwanese e university student: A mediation model of learning self-Efficacy and social self-Efficacy. *Computers in Human Behavior*, *34*, 49-57. https://doi.org/10.1016/j.chb.2014.01.024

Çakır, Ö., & Oğuz, E. (2017). The correlation between high school students' loneliness levels and smart phone addiction. *Mersin University Journal of the Faculty of Education*, *13*(1), 418-429. https://doi.org/10.17860/mersinefd.290711

Durak, H., & Seferoğlu, S. (2018). An examination of smartphone use and addiction among middle school students. *Educational Technology Theory and Practice*, *8*(1), 1-23. https://doi.org/10.17943/etku.288822

Günüç, S., & Kayri, M. (2010). The profile of internet dependency in Turkey and development of internet addiction scale: Study of validity & reliability. *Hacettepe University Journal of Education*, *39*, 220-232. https://dergipark.org.tr/tr/pub/hunefd/issue/7799/102177

Gurbuz, I. B., & Ozkan, G. (2020). What is your level of nomophobia? An investigation of prevalence and level of nomophobia among young people in Turkey. *Community Mental Health Journal*, *56*(5), 814-822. https://doi.org/10.1007/s10597-019-00541-2

Gürol, A., Apay, S. E., Özdemir, S., Seval, U. S. L. U., & Güven, R. (2020). A comparison of nomophobia and social anxiety levels of university students. *Acıbadem University Journal of Health Sciences*, *11*(4), 701-705. http://journal.acibadem.edu.tr/tr/pub/issue/61330/914821#article_cite

Hardell, L., Carlberg, M., & Hansson Mild, K. (2009). Epidemiological evidence for an association between use of wireless phones and tumor diseases. *Pathophysiology*, *16*, 113-122. https://doi.org/10.1016/j.pathophys.2009.01.003

Hoşgör, H. (2020). The factors influencing nomophobia level of university students and the effect of nomophobia on the course performances. *OPUS-International Journal of Society*, *15*(25), 3167-3197. https://doi.org/10.26466/opus.650312

Irmak, M. K., Fadillioglu, E., Guleç, M., Erdogan, H., Yagmurca, M., & Akyol, O. (2002). Effcets of electromagnetic radiation from a cellular telephone on the oxidant and antioxidant levels in rabbits. *Cell Biochemistry and Function*, *20*, 279-283. https://doi.org/10.1002/cbf.976

Kadan, G. (2023). Investigation of Nomofobia and Netlessphobia Levels of Child Development Undergraduate Students. *International Journal of Social Sciences*, *7*(31), 305-326. https://doi.org/10.52096/usbd.7.31.16

Kiziltan, H. S., Eriş, A. H., Bayır, A. G., Trabzon, M., Bülent, H., Yağcı, Ö. T., & Mayadağlı, A. (2014). Thermal and biochemical effects of low level electromagnetic radiation on rat brains and bodies. *Panacea Journal of Pharmacy and Pharmaceutical Sciences*, *3*(2), 29-34. https://www.prlpublisher.com/pharmacy/pjpps

Kumar, R., Kumari, S., Bharti, P., & Sharma, D. (2021). Nomophobia: A rising concern among Indian students. *Industrial Psychiatry Journal*, *30*(2), 230-233. https://doi.org/10.4103/ipj.ipj_134_21

Kuscu, T. D., Gumustas, F., Arman, A. R., & Goksu, M. (2021). The relationship between nomophobia and psychiatric symptoms in adolescents. *International Journal of Psychiatry in Clinical Practice*, *25*(1), 56-61. https://doi.org/10.1080/13651501.2020.1819334

Luis, G. N., Newry R. J., King B. V., & John A. R. (2009). Mobile phone radiation induces reactive oxygen species production and DNA damage in human spermatozoa in vitro. *PLoS One*, *4*(7), e6440–e6446. https://doi.org/10.1371/journal.pone.0006446

Macro. (2004). *A report study of mobile phone usage among the teenagers and youth In Mumbai*. Market Analysis & Consumer Res Organ, *4*, 1–39. https://www.itu.int/osg/spu/ni/futuremobile/socialaspects/IndiaMacroMobileYouthStudy04.pdf

Naeem, Z. (2014). Health risks associated with mobile phones use. *International Journal of Health Sciences (Qassim)*, *8*(4), V–VI. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4350886/

Öztürk, U. C. (2015). "Netlessfobia" stay in connection or not that is the all fear: Fear of being without internet and organizational reflections. *The Journal of International Social Research*, *8*(37), 629-638. https://dergipark.org.tr/tr/download/issue-full-file/42258

Pavithra, M. B., & Madhukumar, S. (2015). A study on nomophobia-mobile phone dependence, among students of a medical college in Bangalore. *National Journal of Community Medicine*, *6*(3), 340-344. https://njcmindia.com/index.php/file/article/view/1204

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879. https://doi.org/10.1037/0021-9010.88.5.879

Sagita, D. D., & Santika, F. (2020). Nomophobia in adolescents based on gender: A case study of East Jakarta, Indonesia. *International Journal of Research in Counseling and Education*, *4*(2), 92-97. https://doi.org/10.24036/00322za0002

Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior*, *29*(6), 2632-2639. https://doi.org/10.1016/j.chb.2013.07.003

Salford, L., Henrietta, N., Arne, B., & et al. (2008). The mammalian brain in the electromagnetic fields designed by man with special reference to blood brain barrier function, neuronal damage and possible physical mechanisms. *Progress of Theoretical Physics Supplement*, *173*, 283–309. https://doi.org/10.1143/PTPS.173.283

Semerci, A. (2019). Nomophobia as the predictor of secondary school students' smartphone addiction. *Bartın University Journal of Faculty of Education*, *8*(3), 947-965. https://doi.org/10.14686/buefad.592443

Spitzer, M. (2015). M-Learning? When it comes to learning, smartphones are a liability, not an asset. *Trends in Neuroscience and Education*, *4*(4), 87-91. https://doi.org/10.1016/j.tine.2015.11.004

Sucu, İ. (2012). Change of direction of the reality fact in the social media games: Smeet game sample. *Gumushane University E-Journal of Faculty of Communication*, *1*(3), 55-88. https://doi.org/10.19145/gumuscomm.98392

Vaidya, A., Pathak, V. R., & Vaidya, A. (2016). Mobile phone usage among youth. *International Journal of Applied Research*, *5*, 1-16. https://doi.org/10.20908/IJARS.V513.9483

Van Endert, T. S. (2021). Addictive use of digital devices in young children: Associations with delay discounting, self-control and academic performance. *PloS One*, *16*(6), e0253058. https://doi.org/10.1371/journal.pone.0253058

Yıldırım, C., & Correia, A. P. (2015). Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. *Computers in Human Behavior*, *49*, 130-137. https://doi.org/10.1016/j.chb.2015.02.059

Yıldız Durak, H. (2019). Investigation of nomophobia and smartphone addiction predictors among adolescents in Turkey: Demographic variables and academic performance. *The Social Science Journal*, *56*(4), 492-517. https://doi.org/10.1016/j.soscij.2018.09.003