

AN INVESTIGATION OF SMARTPHONE ADDICTION AND USAGE AMONG UNIVERSITY STUDENTS

Mustafa Tevfik Hebecci 

The young population nowadays extensively uses mobile phones and smartphones. The attractive features that smartphones offer to users have caused a rapid increase in the usage time of these technological devices. This situation has led to the emergence of the smartphone addiction concept. Considered one of the major problems of the 21st century by many researchers, smartphone addiction is an impulsive disorder caused by excessive and uncontrolled use of smartphones. The research aims to analyse university students' smartphone usage habits and smartphone addiction regarding numerous variables such as gender, daily use time, daily frequency of control, number of social media accounts, and intended use. The sample for the study consists of 366 students. The research data were collected using the Personal Information Form and Smartphone Addiction Scale. The data analysis is done using Kruskal-Wallis and Mann-Whitney-U tests. The results indicate that smartphone addiction levels of university students have a significant difference by gender, daily use time, daily frequency of control, and intended use. However, the number of social media accounts did not differ significantly.

KEYWORDS: Smartphone, Smartphone Addiction, University Students

INTRODUCTION

Mobile phones have reached a wide range of users in a concise time, and they possess crucial features for the 21st century, such as transferring communication to all areas of life and mobility (Aktas & Yilmaz, 2017). With the widespread usage of the Internet, the access to accurate information faster and with ease of use has made mobile phones a core part of daily routine (Castells et al., 2007). Smartphones are the latest form of mobile phones, rapidly evolving

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every year.

Smartphones with mobile phones and basic computer features are user-friendly mobile devices with functions such as accessing mobile Internet via Wi-Fi or cellular networks, recording audio and video, having a developable application centre and operating system, GPS-based navigation, and touch screens (Haug et al., 2015). The mass production of smartphones has led to several positive and negative developments in daily life, business life, and learning environments (Y. K. Lee et al., 2014a; Minaz & Çetinkaya-Bozkurt, 2017). In that sense, a study in China concluded that smartphone addiction might be a new risk factor for high blood pressure in adolescents (Zou et al., 2019).

Smartphones help people communicate in different ways (such as texting, talking, and social media), and it has become almost a mandatory tool for everyday life, which they use to connect to the Internet, play games, use various applications, and listen to music and spend a pleasant time (Han et al., 2017; Jena, 2015). These modern communication tools, which do not go back long, are widely used today, especially by youngsters (Chóliz, 2012; Gezgin et al., 2018; Onal, 2019; Tukul, 2020; Walsh et al., 2011). The data published by Statista (2021) reveals that there are 6.3 billion smartphone users in 2021, which will increase to 7.5 billion in 2026 (Figure 1).

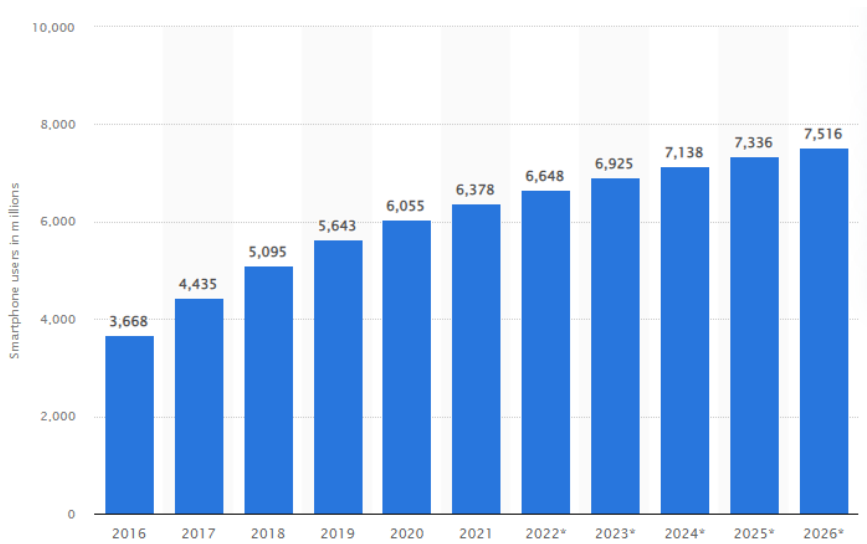


Figure 1. Number of smartphone users from 2016 to 2021 (Statista, 2021)

As they reach a wider user base thanks to their applications, smartphones

have become a key part of daily life (Alfawareh & Jusoh, 2014). Today, they are the first source that people use to find solutions to almost any subject when users encounter any problems. Individuals, especially university students, take photographs of presentations or materials rather than taking notes (Aktas & Yilmaz, 2017) and almost do not spend time away from their smartphones. Tossell et al. (2015) concluded that individuals could give up brushing, exercising, wearing shoes, eating chocolate, and taking a shower instead of living without a smartphone. Although it makes human life more accessible, there is a dependency on a device to such an extent that it becomes an addiction that brings over basic problems and risks.

ADDICTION AND SMARTPHONE ADDICTION

Habits can be characterized as essential activities that enrich people's lives. However, if these habits lead to failure at the point of solving problems or become psychologically, socially, and cognitively threatening, then these existing habits are beginning to create addiction (Ozturk, 1989). The concept of addiction, based on Latin as its origin, is derived from the word "addicere," meaning "to dedicate, to devote oneself to someone else" (Tarhan & Nurmedov, 2011). Egger and Rauterberg (1996) defined addiction as a state of inability to control or give up a substance or behaviour. Addressing the concept of addiction from a more general perspective, the following definition can be suggested: "The continuing use of a substance or an activity, even if it harms the mental and physical health or social life of individuals and continues to affect it negatively, the unavoidable desire to repeat the substance intake or action in question" (Unal, 2015).

Some researchers assert that behavioural addictions can be like biological addictions, such as alcohol and drugs (Bian & Leung, 2015; Stein et al., 1994). Griffiths (1999) argues that technological addictions with human-machine interaction are also behavioural addictions such as gambling and food. Some researchers who argue otherwise suggest that more research and findings are needed for concepts such as smartphone addiction to be considered behavioural addiction (Kardefelt-Winther, 2014; Wang et al., 2015).

Although the first addictions to come to mind are drugs, alcohol, and smoking regarding the concept of addiction, there are also addictions such as gaming, shopping, or mobile phone addiction, which are based on behaviour that does not contain physical substances (Greenfield, 1999). Kim (2013) expresses that behaviour-based addictions are also referred to as behaviour disorders. Excessive and uncontrolled use of smartphones, which help finish many tasks easily and quickly in daily life, can cause psychological, social, and cognitive dangers (Han et al., 2017; Y. K. Lee et al., 2014a; Unal, 2015). In this context, the

importance of smartphones and the increasing frequency of use have brought about some problems, including physical and mental health problems (Kwon et al., 2013):

1. Communication problems (H. S. Choi et al., 2012; Kwon et al., 2013),
2. Security weakness (Kim, 2013),
3. Concentration disorders (Al-Khlaiwi & Meo, 2004)
4. Traffic accidents (Nasar et al., 2008)

REVIEW OF LITERATURE

The literature review shows that there are studies dealing with addictions to mobile phones, including some types such as nomophobia (Pavithra et al., 2015), problematic (smart) phone use (Wang et al., 2015), and smartphone addiction (Herrero et al., 2019). Although these concepts differ in detail, they are quite similar in general. Some researchers found it difficult to define the data obtained with a measurement tool as addiction and proposed that it be called problematic smartphone use (Kardefelt-Winther, 2014). Therefore, while some researchers use the concept of smartphone addiction, others prefer problematic smartphone use. In this research, the concept of smartphone addiction was used. As a general definition, smartphone addiction is an impulsive disorder caused by the uncontrolled and excessive use of smartphones (Bian & Leung, 2015). Besides, nomophobia is defined as the fear of being deprived of a mobile device (Jena, 2015).

Past research in the literature investigated smartphone addiction in many aspects (Alanoglu & Karabatak, 2021; Demirbilek & Minaz, 2020; Gutiérrez et al., 2016; Haug et al., 2015; Kaysi et al., 2021; Kwon et al., 2013; Osorio-Molina et al., 2020; Rahim et al., 2021). Notably, there are fewer studies on smartphone addiction compared to mobile phone addiction. Cha and Seo (2018) conducted one of the studies analysing smartphone addiction in South Korea to examine students' smartphone usage habits, smartphone addiction characteristics, and predictor factors of smartphone addiction. Research results deduce that students use smartphones mainly for messaging, Internet browsing, gaming, and social networking purposes.

Van Deursen et al. (2015) carried out research on smartphone addiction in terms of smartphone usage, emotional intelligence, social stress, self-regulation, gender, and age and concluded that habitual usage behaviours had a significant effect on addiction. In another study, smartphone addiction levels of university students in Korea were studied in terms of different variables (H. Lee et al., 2014). Research results revealed that women have higher smartphone addiction tendencies. Another study by Panova et al. (2019)

focused on the relationship between smartphone use and texting, browsing the Internet, posting social content, reading social content, playing games, anxiety and depression scores, and their variation by country. The study concluded that participants use their smartphones basically for messaging, social networking, and browsing the Internet.

Research by [Cheever et al. \(2014\)](#) reported that university students being detached from smartphones causes anxiety. Students described being detached from a smartphone as not different from separation anxiety. The research also concluded that those who spend more time on smartphones show these symptoms more frequently. Another study by [Soni et al. \(2017\)](#) found that smartphone popularity increases the time individuals spend on smartphones, increasing the tendency for smartphone addiction. [Minaz and Çetinkaya-Bozkurt \(2017\)](#) examined university students' smartphone addiction and usage purposes. According to their research results, no significant difference was found between gender, education and age, and students' smartphone addiction levels. Besides, they suggested that university students mostly use smartphones to access social communication networks, and the average daily use time is 4 hours or more.

SIGNIFICANCE OF THE RESEARCH

Literature reflects that the studies on mobile phone addiction are categorized into two: smartphone (Smartphone) and mobile phone addiction that does not have a smartphone feature (Feature phone). It is essential to underline those studies on the uncontrolled and excessive use of smartphones, which are increasingly used, have been one of the fundamental issues that researchers have addressed in recent years ([H. S. Choi et al., 2012](#); [Herrero et al., 2019](#); [Kuang-Tsan & Fu-Yuan, 2017](#); [Kwon et al., 2013](#)).

Studies on smartphones indicate that mobile phone usage decreases as age increases ([Sanchez-Carbonell et al., 2008](#)). Literature also shows that smartphone addiction is remarkably prevalent among university students ([Aljomaa et al., 2016](#); [Pavithra et al., 2015](#); [Soni et al., 2017](#)). This finding suggests that university students, whose smartphone use is relatively common, have a potential risk of smartphone addiction ([Chóliz, 2012](#)). For this reason, it is important to determine the smartphone addiction of university students and their relationship levels with different variables of possible correlation. Knowing how different variables affect smartphone use and what affects smartphone use the most is paramount in revealing the causes of such addiction. Thus, prevention, treatment interventions, and risk assessment processes can be managed more effectively.

PURPOSE OF THE RESEARCH

This study aims to contribute to the related literature by examining the smartphone usage levels of university students and their smartphone addiction in terms of numerous variables. Thus, this study is regarded as an important resource for researchers studying smartphone addiction. The research seeks answers to the following questions:

1. Do students' smartphone addiction levels differ significantly by gender?
2. Do students' smartphone addiction levels differ significantly by daily use time?
3. Do the students' smartphone addiction levels differ significantly by the daily frequency of control?
4. Do students' smartphone addiction levels differ significantly by the number of social media accounts?
5. Do students' smartphone addiction levels differ significantly by the intended use?

METHODOLOGY

This research was designed with the screening model frequently used by researchers in quantitative research methods. Screening studies conducted with larger sampling groups compared to other research methods are studies in which opinions, interests, skills, and attitudes are determined related to an issue or event ([Fraenkel & Wallen, 2006](#)).

SAMPLE FOR THE STUDY

The research population consists of students studying at a vocational school affiliated with a state university in Turkey and the faculty of engineering at the same university in the 2017-2018 academic year. The research sample was determined by criterion sampling, one of the non-random sampling methods. In this context, the study sample consists of 366 students who study at the same university, voluntarily agreed to participate in this study, and are smartphone users. Table 1 shows the demographics of the participant students.

DATA COLLECTION TOOLS

An electronic form consisting of two different parts was used to collect research data. The first part of this form contains a personal information part, while the second part involves questions on the smartphone addiction scale.

Table 1**Demographics of the Participants.**

Variables		N	%
Gender	Male	246	67.21
	Female	120	32.79
Daily Use Time	1 hour or less	58	15.84
	2-4 hours	195	53.28
	5 hours or more	113	30.88
Daily Frequency of Control	20 times or less	101	27.60
	21-40 times	120	32.78
	41 times and more	145	39.62
Number of Social Media Accounts	0	11	3
	1	57	15.58
	2	76	20.77
	3 and more	222	60.65
Intended Use	Calling and Chatting	118	32.24
	Internet and Social Media	182	49.72
	Other (Gaming, texting, etc.)	16	4.38
	All	50	13.66
Total		366	100

Personal Information Form: The Personal Information Form developed by the researchers consists of questions such as gender, grade, daily use time, intended use, and the frequency of control of smartphones.

Smartphone Addiction Scale: In the context of the research, the Smart Phone Addiction Scale adapted to Turkish by [Demirci et al. \(2014\)](#) was used to determine students' smartphone addiction. The original version of the scale was developed by [Kwon et al. \(2013\)](#). The Cronbach's Alpha reliability coefficient of the scale was calculated as 0.947. The scale consists of 33 items and 7 factors. The first factor is disturbing daily life and tolerance, followed by withdrawal symptoms, positive anticipation, cyberspace-oriented relationships, overuse, social network addiction, and physical symptoms. The range of the 6-point Likert scale is between 33 and 198.

DATA ANALYSIS

The data collected within the scope of the research were analysed using SPSS version 27 demo statistical package software. Before starting the data analysis, normality tests were performed by examining the skewness and kurtosis values to check the normality assumptions. As a result of the evaluations, it was concluded that the data did not show a normal distribution. Hence, non-parametric analysis methods were used in the data analysis. In this context, the Mann-Whitney-U test was used in pairwise group comparisons, and the Kruskal Wallis test was used to compare more than two groups.

Findings of the Study

This section discusses the findings on the significance of the research participants’ gender, daily use time, frequency of control, number of social media accounts, intended use of smartphones and their smartphone addiction levels.

The Mann-Whitney-U test was conducted to determine whether participants’ smartphone addiction levels showed a significant difference by gender. The results from the analysis are shown in Table 2.

Table 2
Mann-Whitney U Test Results of Smartphone Addiction Scores by Gender.

Group	N	Mean Rank	Total Rank	U	p
Male	246	168.06	41342.5	10961.5	<0.001
Female	120	215.15	25818.5		

p<0.05

The analysis of results demonstrate that university students significantly differ in smartphone addiction levels by gender (U=10961.5, p<0.05). The mean ranks reflect that female participant have higher levels of smartphone addiction than male participants.

The Kruskal-Wallis test was carried out to determine whether university students’ smartphone addiction levels differ significantly by their daily use time, frequency of control, intended use, and the number of social media accounts. Table 3 shows the results of the analysis.

Table 3

Kruskal-Wallis Test Results of Smartphone Addiction Levels by Daily Use Time, Frequency of Control, Intended Use, and Number of Social Media Accounts.

Variables		N	Mean Rank	SD	χ^2	p	Sig Diff
Daily Use Time	1 hour or less	58	115.97	2	56.289	<0.001	3-1, 3-2, 2-1
	2-4 hours	195	171.85				
	5 hours or more	113	238.27				
Daily Frequency of Control	20 times or less	101	138.54	2	52.231	<0.001	3-1, 3-2, 2-1
	21-40 times	120	163.49				
	41 times and more	145	231.38				
Intended Use	Calling and chatting	118	161.43	3	13.783	0.003	2-1, 2-4
	Internet and Social Media	182	203.02				
	Other (Gaming, texting, etc.)	16	194.75				
	All	50	160.95				
Number of Social Media Accounts	0	11	152,00	3	2.693	0.441	-
	1	57	177,20				
	2	76	173,63				
	3 and more	222	190,06				

p<0.05

The results suggest that smartphone addiction levels among university students differ significantly by daily use time ($\chi^2 = 56.289$, $p < 0.05$), daily frequency of control ($\chi^2 = 52.231$, $p < 0.05$), and intended use ($\chi^2 = 13.783$, $p < 0.05$). However, it does not differ significantly by the number of social media accounts ($\chi^2 = 2.693$, $p > 0.05$). The findings also indicate that daily smartphone use time, frequency of control, and intended use have different effects on smartphone addiction. The Mann Whitney U test, which was performed to determine the significant differences observed between the groups, showed a significant difference among 3-1, 3-2, and 2-1 groups in terms of daily use time; among 3-1, 3-2, and 2-1 groups in terms of frequency of control; and

among 2-1 and 2-4 groups in terms of intended use. Based on these findings, those who spend a long time with a smartphone, control the smartphone more and use the smartphone for internet and social media purposes have high smartphone addiction scores. In other words, individuals who interact with the smartphone for longer periods and use smartphones mainly for internet and social media intentions are in the risk group for smartphone addiction.

DISCUSSION, CONCLUSION, AND SUGGESTIONS

Smartphones make human life easier if used consciously (efficient use of time, easy access to information, etc.), and they are one of the most powerful technological tools of recent years (Minaz & Çetinkaya-Bozkurt, 2017). Today, excessive, and improper use of smartphones that appeal to a broad audience of almost all ages has brought negative concepts such as smartphone addiction, nomophobia, and problematic smartphone use (Soni et al., 2017). This study investigated the smartphone addiction levels of university students in terms of gender, daily use time, daily frequency of control, number of social media accounts, and intended use of smartphones.

This research found out that the level of smartphone addiction shows a significant difference by gender. In other words, female students have higher levels of smartphone addiction than male students. In another study that supports this finding, Kuang-Tsan and Fu-Yuan (2017) concluded that female students have a higher tendency to use smartphones than male students. Many studies in the literature have similar results (S. W. Choi et al., 2015; Kwon et al., 2013; H. Lee et al., 2014). However, contrary to this research, some studies have no significant relationship between smartphone addiction and gender (Kuyucu, 2017; Kwon et al., 2013).

The literature proposes that women have more tendency toward smartphone addiction than men. Altundağ and Bulut (2017) explained this finding as an effect of female students spending more time on smartphones than men and preferring indirect communication. They also emphasized that it may be because women more frequently use various social media platforms such as WhatsApp, Facebook, and Instagram than men. Gezgin et al. (2018) explained this situation as female students using smartphones more frequently and meeting their socialization needs through smartphones.

Another notable research result is that the level of smartphone addiction differs significantly by daily smartphone use time. In this context, individuals who spend five hours a day or more with a smartphone have a higher level of addiction than others. There are studies with similar results in the literature, one of which is a study conducted in Switzerland by Haug et al. (2015) which concluded that there is a correlation between daily smartphone use time and

smartphone addiction. Similarly, the literature review suggests that there have been studies that highlight that students' increasing phone use time leads to an increase in the level of smartphone addiction (Aljomaa et al., 2016; Han et al., 2017).

When students' smartphone addiction levels were analysed in terms of the frequency of controls, it was concluded that students who checked "41 times and more" had the highest smartphone addiction score. This result indicates that students who control their smartphones too frequently during the day have higher levels of smartphone addiction than those who control them less. Sirakaya (2018) revealed a similar conclusion and found that increasing the frequency of smartphone controls during the day increased nomophobia. Additionally, Lin et al. (2015) concluded that the frequency of smartphone use has a stronger relationship with smartphone addiction than the duration of use. Research by H. Lee et al. (2014) also has similar results. All these studies reflect that the frequency of using a smartphone affects smartphone addiction. If this condition continues in this way, it will affect young people psychologically and physiologically, bringing important health problems (Keskin et al., 2018; Kuyucu, 2017).

Social media has a vital place in most studies on smartphone addiction. As a result of the analysis carried out in this research, it was deduced that students' smartphone addiction levels did not differ significantly by the number of social media accounts. Studies in line with this finding are available in the literature (Barnes et al., 2019; Chen et al., 2017). Research carried out by Haug et al. (2015) revealed that texting, reading news, and using social networks have a decisive effect on smartphone addiction. Another study inferred that increased social media use would also increase smartphone addiction (Isik & Kaptangil, 2018). When the results of the studies in the literature are considered, it can be argued that students often use social media through smartphones, which has affected smartphone addiction.

In line with the latest research studies, smartphone addiction was evaluated based on the intended use of smartphones. The findings demonstrated that those using the smartphone for internet and social media purposes have higher levels of smartphone addiction. Past research in the literature reports that there are similar results. Gezgin et al. (2018) concluded that university students often use their smartphones for social networking, searching, communicating on the Internet, texting, music, and watching videos. Another study supporting these results found that university students often use their smartphones with the intention of learning and having fun (surfing the Internet, spending time on social networking sites, music, etc.) (Aktas & Yilmaz, 2017). Another study concluded that students who used the smartphone for social media and shopping had significantly higher levels of nomophobia than those who did not.

The same research revealed that smartphone use for reading news, gaming, and academic purposes does not affect nomophobia (Sirakaya, 2018).

It is undeniable that smartphone technology will develop more rapidly in the following years. Although these developments will significantly facilitate human life, they will bring significant problems. Many studies reported that the most important problems are related to smartphone addiction and nomophobia (Han et al., 2017; Pavithra et al., 2015). A more detailed study of smartphone addiction, which many experts think causes problems such as sleep disorder, anxiety, loneliness, and despair, is regarded as essential in terms of its effects on social and educational settings.

University students who will have a say in education, health, and ruling the country in the future must follow contemporary technologies. However, these technologies need to be used consciously and in a controlled manner. In this regard, some regulations can be made for the conscious use of technology to help students become more aware of threats and benefits. Therefore, it is vital to increase the number of studies examining the use of smartphones by youngsters. Social media, which many consider to be the main cause of smartphone addiction, can also be an important guide to solving this problem. Studies on this subject are usually quantitative studies that reveal the overall perspective in the screening model. Hence, studies with different research methods, primarily qualitative and experimental, should be carried out in the future. Consequently, of the 30 studies examined by Pamuk and Kutlu (2017), only one was qualitative, there was no mixed-method research, and the experimental design was quite limited in quantitative studies.

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