Investigation of Smartphone Addiction of Middle School and High School Students[1]

Servet ERKOL
Yüksek Lisans Öğrencisi, M.Ü. Lisansüstü Eğitim Enstitüsü
GSM: (0)5070471077
servet_erkol@hotmail.com
ORCİD: 0009-0006-6508-5502

Sabit MENTEŞE
Prof. Dr. Munzur Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Siyaset Bilimi ve Kamu Yönetimi Bölümü, TUNCELİ,
GSM: (0)539 346 86 38
smentese@munzur.edu.tr
ORCID ID: https://orcid.org/0000-0003-4901-4481,

Murat GÖKALP
Ağrı İbrahim Çeçen Üniversitesi Eğitim Bilimleri Bölümü AĞRI
mgokalp@agri.edu.tr
ORCID ID 000-0003-4928-6954

ABSTRACT
Addiction is the state of being addicted to any activity, substance, object or behavior in a way that excludes other activities of one's life or causes physical, mental or social harm to oneself and others. In addition to many and various types of addiction, it seems that an important type of addiction is technology addiction. Today, the dizzying development of technological developments and their inclusion in every aspect of our lives has made it necessary for us to rethink the concepts of far and near. With the rapid development in mobile phone technology, the standard mobile phones used in the past to call someone or send a message to someone have been replaced by state-of-the-art smartphones that make our daily lives much easier. However, on the other hand, it is seen that addiction to smartphones, which have become an integral part of life, is on the rise, and this goes back to pre-school periods. In this context, the aim of the research was determined to examine whether the smartphone usage level of students studying in secondary and high schools affiliated to the National Education Directorate of Tunceli province Hozat district in the 2022-2023 academic year varies significantly according to some demographic characteristics of the students. Within the scope of quantitative research, the data of the research designed in the general survey model were collected by applying the "Smartphone Addiction Scale Short Form (ATBÖ-SF)", developed by Kwon et al. and adapted to Turkish by Noyan et al., face to face between May and June 2023. The scale, for which validity and reliability studies were conducted, was found to be suitable for the use of parametric tests, and in addition to test analyzes such as frequency, percentage, arithmetic mean, T Test and One-Way Variance Analysis were used to determine the significance of the difference using statistical data analysis techniques. As a result of the analysis, the average smartphone addiction level being below 3 was interpreted as the students not having smartphone addiction, but the measurements being just below the average indicating a risk factor, while the difference between the dependent and independent variables was not significant ($p<.005$). According to the research findings, the smartphone addiction level of students at the lower limit of addiction carries a risk factor, in this respect the findings are warning, and it is recommended that parents, society, and especially schools and relevant institutions and organizations take precautions against the apparent danger.
Keywords: Smartphone, student, education, addiction, technology

INTRODUCTION

In today's world, where progress in science and technology has reached incredible dimensions, social life is also seen to be keeping pace with this rapid change and transformation, much like the interconnected pieces of a puzzle. The dizzying pace of technological developments, and their inclusion in every aspect of our lives, has prompted a reevaluation of the concepts of distance and proximity (Gürkan et al., 2022). With the rapid advancements in mobile phone technology, the standard mobile phones, which were once used solely for calling or texting, have been replaced by state-of-the-art smartphones that greatly simplify daily life. Nowadays, tasks and processes that

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could only be performed with computers in the past can be easily carried out with smartphones (Çakır & Oğuz, 2017).

Smartphones offer numerous activities that simplify human life and have positive effects, such as easy access to desired data, data sharing, enhanced communication opportunities, listening to music, taking photos, using social media, making friends, playing online and offline games, accelerating banking transactions, and online shopping from websites (Şimşek & Zabun, 2019). However, alongside the expected conveniences that smartphones bring, especially as they are used for an increasing variety of purposes, a significant impact of their use manifests in the form of addiction. Research findings show that smartphones, which have found widespread use not only among different age groups but also among middle and high school students, have addictive effects. This has drawn attention to individuals at this educational level. In this context, the main theme of this study is to examine the level of smartphone addiction among students in the pre-university education stage.

PROBLEM STATEMENT

Communication is the state in which living beings, especially humans, interact with each other by using visual and auditory symbols to convey their emotions, knowledge, and ideas. In other words, communication is the transmission of information, ideas, attitudes, or feelings from one person or group to another (or others) via symbols, as described by Bülbül (as cited in Çakır & Topçu, 2005, p.2). It is the process of assigning meaning to the message through the exchange of information between a source and a receiver via a channel. Communication, which was quite limited in ancient times, has reached a mass scale and an incredible speed due to advancements in science, technology, and technical tools. For example, communication, which in prehistoric times was carried out using a single method like smoke signals, reached its second method, cuneiform writing, around 3100–2500 BCE. Subsequently, in the 1st and 2nd centuries, it evolved to the use of courier letters, and by 2900–3500 BCE, pigeons were used for postal services. In the 17th century, communication witnessed tremendous development. Newspapers, which delivered daily information to the masses, came into play, significantly increasing both the scope and speed of communication, as well as the number of individuals engaged in the process.

Initially, books were a communication tool limited to a very small, elite group compared to newspapers. By 1784, postal carriages began to be included as carriers of information, news, etc. The invention and use of the telegraph between 1791-95 weakened the influence of postal carriages in the communication world while leading to another development. In the 1830s-40s, postage stamps were introduced into postal services. The laying of transcontinental cables became possible in the 1850s-60s, bringing communication to a transcontinental level (Barbier, 2001; Güneş, 2013:290). The telephone, invented in the 1870s, drastically shortened the time between the invention of the second, third, and fourth communication tools, serving as a harbinger of further developments. This new development became even more effective with the inclusion of radio in the process in the early 1900s, removing all barriers to the advancement of communication and communication tools.

By the 1920s, airmail was introduced, and in the 1960s, communication satellites were launched, allowing live broadcasts to be delivered to people through television. The early 20th century saw the introduction of the internet (with email enabling instant communication), and by the beginning of the 21st century, mobile communication and mobile phones (or smartphones) became part of mass use (Güneş, 2013:294). This led to an unprecedented speed and continuity in communication, bringing people from all over the world closer together and perfectly completing a crucial leg of globalization. In other words, while globalization was completed on the economic level, it was also achieved in terms of communication. However, the problem here is that the accessibility of communication tools, which was once insufficient for people, has now increased to the point where it has reached the level of addiction through mobile phones (Aydoğan, 2013; Baldini, 2000; Barbier, 2001; Toplu, 2008; Aymaz, 2018; Uslu, 2021).

Over the past fifteen years, the use of mobile devices during childhood has significantly increased in many countries (Rideout, Saphir, Pai, & Rudd, 2013). A recent study in the UK found that children now spend more time online than watching TV, with tablets and smartphones being the devices most frequently used by children to access the internet (Ofcom, 2016). Similar studies conducted in other countries suggest that more Asian children and adolescents are developing smartphone addiction (Çelik, 2020; Çelik & Ulusoy, 2019; Ektiricioglu et al., 2020; TÜİK, 2022), with a growing trend towards younger ages and an increasing rate of smartphone addiction among individuals in pre-university education. Given this situation, it becomes crucial to examine the causes and consequences of smartphone addiction across all educational levels nationwide, as well as to analyze it based on some demographic characteristics of students. This would help gather reliable data, which could assist decision-makers in taking timely and meaningful actions to mitigate potential negative impacts on children and adolescents.

Research Purpose

The aim of this study is to examine the smartphone addiction levels of middle and high school students based on certain demographic characteristics and to develop recommendations in light of the findings. To achieve this, the following research questions were addressed:

1. What is the level of smartphone addiction among students?
2. Do students' smartphone addiction scale scores show a significant difference based on gender?
3. Do students' smartphone addiction scale scores show a significant difference based on school level?
4. Do students' smartphone addiction scale scores show a significant difference based on their parents' income levels?
5. Do students' smartphone addiction scale scores show a significant difference based on their parents' educational levels?
6. Do students' smartphone addiction scale scores show a significant difference based on their parents' occupations?

METHOD

This section provides information on the research model, the population and sample, data collection methods, data collection tools, and data analysis.

Research Model

This research was designed using the general survey model within the scope of quantitative research. The most fundamental principle of quantitative research is to express the findings in numerical terms, making them measurable, and to base the research on hypotheses, testing these hypotheses (Ekiz, 2003, p.93). Survey studies, which are widely used in social sciences and allow for large-scale analysis, typically describe the existing performance, views, thoughts, and attitudes of the target group, such as gender, age, and socioeconomic status, either individually or in relation to some factors (Büyüköztürk, 2014, p.2; Gurbetoğlu, 2018). According to Christensen and colleagues (2015, p.368), survey research aims to reveal changes over time or uncover the underlying aspects of a particular situation.

Population and Sample

The population of the study consists of a total of 232 students enrolled in middle and high schools affiliated with the Hozat District Directorate of National Education in Tunceli during the 2022-2023 academic year. Among these students, 118 are in middle school and 114 are in high school (Table 1). Since it was possible to reach the entire population, no sampling method was used.

Table 1. Data of Middle and High Schools from the Hozat District Directorate of National Education for the 2023-2024 Academic Year

School Type	Number of Students	Number of teachers	Number of students
Ercan Doğan Middle School	118	19	118
Zübeyde Hanım High School	114	11	114
Total	232	30	232

Despite the response rate of the administered scale being 82%, the number of scales that could be subjected to statistical analysis remained at 144. This represents 62% of the total participants. Accordingly, the personal characteristics of the 144 participants are presented in Tables 3.2, 3.3, 3.4, and 3.5.

Table 2. Percentage and Frequency Distribution of the Personal Characteristics of Participants (N=144)

Variables	Characteristics	Frequency (f)	Percentage (%)
Gender	Female	73	50.7%
	Male	71	49.3%
School Type	Middle School	62	43.1%
	High School	82	56.9%
Father's Occupation	Not Working	33	22.9%
	Worker	77	53.5%
	Civil Servant	25	17.4%
	Retired	9	6.3%
Mother's Occupation	Not Working	109	75.7%
	Worker	20	13.9%

	Civil Servant	15	10.4%
	Other	23	16.0%
Family Income Level	Medium	101	70.1%
	High	16	11.1%
	Very High	4	2.8%

Table 2 presents the percentage and frequency distribution of certain personal characteristics of the participants. As shown in the table, 50.7% of the participants are female, while 49.3% are male. Among them, 43.1% are middle school students, and 56.9% are high school students. When examining the occupations of their fathers, it can be noted that 22.9% of the fathers are not working, 53.5% are workers, 17.4% are civil servants, and 6.3% are retired. In terms of mothers' occupations, 75.7% of the mothers of the participating students are not working and are homemakers. Meanwhile, 13.9% are workers, and 10.4% are civil servants. According to the perceptions of income levels in Turkey, 16.0% of the participants perceive their families as having low income, 70.1% as having medium income, 11.1% as having high income, and 2.8% as having very high income.

The information regarding the responses to other questions included in the personal information form of the participants is provided below.

This includes the daily smartphone usage duration of the participants, the smartphone brands they use, and the level of impact smartphone usage has on their lives.
The percentage and frequency distribution regarding the daily smartphone usage duration, the smartphone brands used, and the level of impact on their lives is presented in Table 3.

Table 3. Percentage and Frequency Distribution of Participants' Daily Smartphone Usage Duration, Smartphone Brand, and Impact Level on Their Lives

Variables	Characteristics	N	%
Daily Usage Duration	0-2 Hours	60	41.7
	2-4 Hours	52	36.1
	4-6 Hours	22	15.3
	6-8 Hours	8	5.6
	8 Hours and Above	2	1.4
Smartphone Brand	Apple	34	23.6
	Samsung	58	40.3
	Huawei	14	9.7
	Other	38	26.4
Impact of Smartphone on Life	Not at all	23	16.0
	Very little	39	27.1
	Partially	53	36.8
	It affects	23	16.0
	It affects a lot	6	4.2
Do You Think You Are Addicted?	Yes	16	11.1
	No	78	54.2
	Partially	44	30.6
	No opinion	6	4.2

Table 3 shows the distribution of participants' daily smartphone usage time, the brands of smartphones they use, the extent to which smartphone usage affects their lives, and their opinions on whether they consider themselves smartphone addicts. According to Table 3, it can be seen that the participants use their smartphones for the most part between 0-2 hours a day, which accounts for 41% of the group. The second most common usage time is between 2-4 hours, with 36.1%. In third place, 15.3% use their smartphones for 4-6 hours a day, while 5.6% use them for 6-8 hours, and only 1.4% use them for 8 hours or more a day.

When asked about the brand of smartphone they use, the participants indicated that the highest percentage, 40.3%, use Samsung smartphones. Additionally, 26.4% reported using smartphones other than Apple, Samsung, and Huawei, while 23.6% use Apple and 9.7% use Huawei smartphones.

In response to the question of how much smartphones affect their lives, 36.8% of participants stated that smartphones affect them to some extent, 27.1% indicated that they affect them very little, 16.0% said they do not affect them at all, and 4.2% claimed that smartphones affect them very much.

Regarding whether the participants consider themselves smartphone addicts, 54.2% stated that they are not addicted, 30.6% said they are somewhat addicted, 11.1% said yes, they are addicted, and 4.2% did not express any opinion.

Participants' Purpose of Smartphone Usage
The percentage and frequency distribution of the participants' purpose of smartphone usage is presented in Table 4.

Table 4. Percentage and frequency distribution of smartphone usage purposes

Variables		N	%
Purpose of Smartphone Usage	Social Networks	83	57.6
	Talking	50	34.7
	Browsing the Internet	48	33.3
	SMS	105	72.9
	Educational Applications	51	35.4
	Checking Social Networks	54	37.5
	Playing Games	61	42.4
	Listening to Music	38	26.4
	Making Calls	51	35.4
	Checking Emails, Correspondence	123	85.4
	Text Messaging	109	75.7
	Watching TV/Movies	57	39.6
	Reading Books	108	75.0
	Taking Photos	55	38.2
	Checking News	93	64.6
	Others (if any)	130	90.3

Table 4 shows the percentage and frequency distribution of the purposes of smartphone usage. According to the examination of Table 4, it can be observed that students indicated they use smartphones primarily for listening to music, at a rate of **73.6%**. Additionally, **66.7%** reported using them for browsing the internet and **65.3%** for communication. The lowest usage purposes were found to be checking emails at **14.6%** and text messaging at **24.3%**. Information about the sample group is provided in the tables below.

The Most Used Type of Social Media Among Smartphone Users
The percentage and frequency distribution of the most used types of social media on smartphones is shown in Table 5.

Table 5. Percentage and frequency distribution of the most used social media on smartphones.

Variable	Feature	N	%
The Most Used Social Media on Smartphones	Instagram	74	51.4
	WhatsApp	79	54.9
	Twitter	19	13.2
	Facebook	13	9.0
	YouTube	83	57.6
	Other (if any)	16	11.1

Table 5 shows the percentage and frequency distribution of the social media tools most used by students on their smartphones. According to the table, YouTube ranks first with 57.6%, followed by WhatsApp in second place with 54.9%, and Instagram in third place with 51.4%. Twitter comes in fourth with 13.2%, while other social media networks rank fifth with 11.1%. Finally, Facebook is the least used, with 9.0%.

Data Collection
The data for this research was collected using the Short Form of the Smartphone Addiction Scale (ATBÖ-KF) in addition to a personal information form. The necessary permissions for the application of the scale were obtained

based on the researcher's application dated 02/03/2023 with reference number 7377, according to the decision numbered 2023/06-06 of the Munzur University Non-Invasive Research Ethics Committee.

Information about the Short Form of the Smartphone Addiction Scale (ATBÖ-KF)
The long form of the smartphone addiction scale developed by Kwon et al. (2013) consists of 33 questions, while the short form designed for adolescents (the transition period from childhood to adulthood) contains 10 questions. The short form was adapted into Turkish by Noyan et al. (2015) and its validity and reliability were tested among university students. It was shown to have a single-factor structure, and its sub-scales have not been defined. The calculated Cronbach alpha value is reported to be 0.867, indicating that it is valid and reliable for assessing smartphone addiction in young adults. The scale, consisting of 10 questions, is rated on a scale from 1 to 6. The ratings are as follows: 1 – Strongly disagree, 2 – Disagree, 3 – Slightly disagree, 4 – Slightly agree, 5 – Agree, 6 – Strongly agree. The scale demonstrates a one-factor structure, and scores range from 10 to 60. As the score obtained from the scale increases, the risk of smartphone addiction also increases. According to a standardization study, if a student's total score from the scale is below 29.50, they are not considered a smartphone addict, while a score above 29.50 indicates smartphone addiction.

Validity and Reliability Analyses of the Short Form of the Smartphone Addiction Scale (ATBÖ-KF) Used in the Research.

Reliability Analysis of the Short Form of the Smartphone Addiction Scale (ATBÖ-KF)
The reliability of the scales used in the research indicates how accurately the scales measure the behaviors we aim to assess in the participants (Kurtuluş, 2006:374). In measuring the reliability of the questions in the questionnaire evaluated in this study, the Alpha Value (Cronbach Alpha) and item-total correlation values were used. According to some researchers (Büyüköztürk, 2004, 165), an alpha coefficient greater than 0.70 indicates a high reliability scale, while others (Kalaycı et al., 2006, 403) suggest that a value of 0.60 and above in social sciences also indicates a scale of high reliability.

Table 6. Alpha coefficient values of the Short Form of the Smartphone Addiction Scale (ATBÖ-KF)

	Scale Mean (when the item is removed)	**Scale Mean** (when the item is removed)	**Scale Mean** (when the item is removed)	**Scale Mean** (when the item is removed)
S 1	23,02	101,265	,639	,891
S 2	23,25	100,399	,655	,890
S 3	22,92	99,679	,646	,891
S 4	22,63	95,143	,701	,887
S 5	23,06	96,458	,731	,885
S 6	23,17	101,263	,607	,893
S 7	23,11	99,680	,670	,889
S 8	23,42	103,085	,547	,897
S 9	22,72	96,079	,710	,886
S 10	22,63	98,290	,607	,894
N= 144 (α) = 0.900 Number of Variable = 10				

Internal Consistency and Reliability of the "Smartphone Addiction Scale-Short Form" (SAS-SF)
The internal consistency and reliability of the 10-item "Smartphone Addiction Scale-Short Form" (SAS-SF) were first assessed by looking at the alpha coefficient values. Previous research has reported the Cronbach's alpha coefficient for the SAS-SF as 0.90. For this study, the α value of the scale was calculated to be 0.900. According to the obtained alpha (α - Cronbach's Alpha) coefficient, the scale has a very high reliability (Table 6).
To test the reliability of the scale, in addition to the alpha value, the total score correlation values of the scale were also examined (Şencan, 2005, 257-62; Büyüköztürk, 2004, 165). This value should be greater than 0.30. As seen in Table 6, no value below 0.54 is observed. Therefore, according to the item-total score correlation values, the questionnaire is reliable.

Validity Analysis of the Smartphone Addiction Scale-Short Form (SAS-SF)
The long form of the smartphone addiction scale developed by Kwon et al. (2013) consists of 33 questions, while the short form developed for adolescents (the transitional period from childhood to adulthood) consists of 10 questions. The short form has been adapted into Turkish by Noyan et al. (2015) in Turkey, and its validity and reliability have been studied among university students. It has been shown to have a single-factor structure, and

no subscale has been defined. The calculated Cronbach alpha value is reported as 0.867, indicating that it is valid and reliable for assessing smartphone addiction in young adults. The scale, consisting of 10 questions, is scored on a scale from 1 to 6. The scoring is as follows: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 6 - Strongly Agree. In the interpretation of the findings, as the score obtained from the scale increases, the risk of smartphone addiction also increases; according to the standard-setting study conducted, if a student's total score from the scale is below 29.50, they are not considered a smartphone addict, while a score above 29.50 indicates smartphone addiction. In other words, the cutoff score of the scale has been obtained as 29.50, regardless of gender. Participants scoring below this value are not assessed as smartphone addicts, while those with higher scores are considered to be smartphone addicts.

Factor Analysis for the Scale's Validity

Factor analysis was conducted to assess the validity of the scale. To determine whether the data collected from respondents are suitable for factor analysis, KMO (Kaiser-Meyer-Olkin) and Bartlett tests were applied. The KMO value should be above 0.5, and the Bartlett test should yield significant results (Kalaycı et al., 2006:321-322). Additionally, it is preferred that the factor loadings for the items found through factor analysis be 0.40 or higher (Büyüköztürk, 2004).

As a result of the factor analysis, the Kaiser-Meyer-Olkin (KMO) value for the Smartphone Addiction Scale-Short Form (SAS-SF) was found to be 0.910. A KMO value above 0.50 indicates that the scale is suitable for factor analysis (Büyüköztürk, 2004).

Secondly, the Bartlett test values were examined regarding the factor analysis. The significance value of the "Smartphone Addiction Scale" question list was found to be significant ($p = 0.000<0.01$; $\chi^2=658.252$). Furthermore, the 10 statements included in the smartphone addiction scale explain 52.950% of the total variance, indicating that it is unifactorial.

Analysis of the Data

For the analysis of the data, statistical test techniques were applied, and the normal distribution was checked using Skewness and Kurtosis values, both of which were found to be between -1.00 and +1.00. Considering that the Skewness (.683) and Kurtosis (-.109) values are referenced for normal distribution of scale scores in social sciences, it can be concluded that the scale scores of the "Smartphone Addiction Scale-Short Form" demonstrate normal distribution.

FINDINGS

In this section of the study, the findings related to the research problem and sub-problems are presented.

What is the level of smartphone addiction among students?

The first sub-problem of the research is stated as "What is the level of smartphone addiction among students?" The total scores, mean, and standard deviation values obtained from the scale are presented in Table 7.

Table 7. Students' Participation Levels in the Smartphone Addiction Scale

Measure	Min.	Max.	Mean Participation Level ($\bar{x}$)	Standard Deviation
Smartphone Addiction	10	55	25.54	1.1

Participants' Responses to the Smartphone Addiction Scale

Participants demonstrated a mean participation level of $\bar{X} = 25.54$ in the "Smartphone Addiction" scale, indicating a near-moderate level of engagement. In other words, since the students' smartphone addiction levels remained below $\bar{X} = 29.50$, it can be interpreted that they are not considered smartphone addicts.

The levels of agreement regarding the statements included in the scale are presented in Table 8.

Table 8.: Levels of Agreement

Scale	Statements	Average Participation Level ($\bar{x}$)	Standard Deviation
Smartphone Addiction	1. I cannot keep up with the tasks I planned because of smartphone use.	25.3	1.38
	2. I have difficulty concentrating while doing assignments or listening to lessons in class due to smartphone use.	23.0	1.42
	3. I feel pain in my wrists or neck when using my smartphone.	26.3	1.48
	4. I cannot live without my smartphone.	29.2	1.68

	5. I feel impatient and irritable when I do not have my smartphone in my hand.	2.49	1.54
	6. Even if I don't use it, my smartphone is always on my mind.	23.8	1.44
	7. Even if my daily life is greatly affected, I will never stop using my smartphone.	24.4	1.44
	8. I constantly check my smartphone to avoid missing conversations among other people on Twitter or Facebook.	21.2	1.43
	9. I use my smartphone for longer than I think.	28.3	1.60
	10. People around me say that I use my smartphone too much.	29.2	1.66

Table 8: When examining the levels of participation in the smartphone addiction scale, the highest participation was observed for the statements "People around me say that I use my smartphone too much" (M: 29.2) and "I can't live without my smartphone" (M: 29.2). Additionally, high levels of participation were noted in the statements "I use my smartphone longer than I think" (M: 28.3), "I feel pain in my wrists or neck when using my smartphone" (M: 26.3), and "I can't complete my planned tasks because of smartphone use" (M: 25.3). According to the calculations made for all statements, the addiction score is below M = 29.50; therefore, they appear to have a lower level of addiction. However, it should be noted that the level of smartphone addiction is close to the midpoint, suggesting that there may be a risk of addiction.

Do the smartphone addiction scale scores of students show a significant difference based on gender? Findings related to the sub-problem statement:

The second sub-problem statement of the study is expressed as "Do the smartphone addiction scale scores of students show a significant difference based on gender?" The total scores, means, and standard deviation values obtained from the scale are presented in Table 9.

Table 9: Smartphone addiction scores of students based on gender - Test results

				Levene Test		t Test		
Scale	n	x̄	ss	F	p	sd	t	p
Smartphone addiction								
Famale	73	25,12	10,73	,986	,322	142	-,469	,640
Male	71	25,98	11,32					

*Independent Samples t-Test, *<0,05, **<0,01*

To determine whether there is a significant difference in the perceptions of "Smartphone Addiction" based on the gender of the participants, the results of an independent samples t-test indicated that no statistically significant difference was found in students' perceptions of smartphone addiction according to their gender (t: -0.469; p: 0.640 > 0.05). This finding can be interpreted as indicating that there is no significant relationship between smartphone addiction and gender.

Do students' smartphone addiction scale scores show a significant difference according to school levels? Findings related to the sub-objective sentence.

The third sub-objective problem statement of the research is expressed as “Do students' smartphone addiction scale scores show a significant difference according to school levels?” The total score, mean, and standard deviation values obtained from the scale are presented in Table 10.

Table 10. Differences in students' smartphone addiction based on school types

				Levene Test		t Test		
Scale	n	x̄	ss	F	p	sd	t	p
Smartphone addiction								
Secondary School	62	22,67	10,00	4,410	,038	142	-2,787	,006**
High School	82	27,71	11,28					

*IndependentSamples t-Test, *<0,05, **<0,01*

To determine whether there is a significant difference in the perceptions of "Smartphone Addiction" based on the type of school variable among the participants, the results of an independent samples t-test showed that a statistically significant difference was found in students' perceptions of smartphone addiction according to their

school types (t: -2.787; p: 0.006 < 0.01). Accordingly, students studying at the high school level have higher levels of smartphone addiction (M: 27.71) compared to those studying at the middle school level (M: 22.67).

Findings Related to the Sub-objective Sentence on the Differences in Smartphone Addiction Based on Class Levels

The fourth sub-objective problem statement of the research is expressed as “Do students' smartphone addiction scale scores show a significant difference according to class levels?” The total score, mean, and standard deviation values obtained from the scale are presented in Table 11.

Table 11. One-way ANOVA results of students' smartphone addiction based on class levels

Dimensions	n	x̄	Stand Dev	Variance.	Total Squares	sd	Mean Squares	F	p	LSD
Smartphone Addiction										
1. 1.st class	26	26,23	10,15	Between Groups	1107,494	3	369,165	3,190	,026*	2-1
2. 2nd. class	32	20,43	8,65	Within gr.	16202,166	140	115,730			2-3
3. 3rd.class	49	27,57	11,81	Total	17309,660	143				2-4
4. 4th. class	37	26,81	11,30							
Total	144	25,54	11,00							

*One Way ANOVA, *<0,05, **<0,01*

To determine whether there is a significant difference in the perceptions of "Smartphone Addiction" based on the class level variable among the participants, the results of the one-way ANOVA analysis indicated that a statistically significant difference was found in students' perceptions of smartphone addiction according to their class levels (F: 3.190; p: 0.026 < 0.05). The difference found is significant in favor of 2nd-grade students. Accordingly, the smartphone addiction levels of 2nd-grade students were found to be lower than those of students in other grades.

Findings Related to the Sub-objective Sentence on Differences in Smartphone Addiction Scale Scores According to Parents' Income Levels.

The fifth sub-problem of the research is expressed as “Do students' smartphone addiction scale scores show a significant difference according to their parents' income levels?” The total score, mean, and standard deviation values obtained from the scale are presented in Table 12.

Table 12. One-way ANOVA results of students' smartphone addiction based on family income levels

Dimensions	n	x̄	Stand Dev	Variance.	Total Squares	sd	Mean Squares	F	p	LSD
Smartphone Addiction										
1. None	23	29,21	11,02	Between Groups	675,901	3	225,300	1,896	,133	
2. Moderata	101	24,60	11,21	Within gr.	16633,759	140	118,813			
3 Very much	16	27,93	9,08	Total	17309,660	143				
4. Quite a lot	4	18,75	6,80							
Total	144	25,54	11,00							

*One Way ANOVA, *<0,05, **<0,01*

To determine whether there is a significant difference in the perceptions of "Smartphone Addiction" based on the family income levels of the participants, the results of the one-way ANOVA analysis indicated that no statistically significant difference was found in students' perceptions of smartphone addiction according to their family income levels (F: 1.896; p: 0.133 > 0.05).

Findings Related to the Sub-objective Sentence on the Significant Differences in Smartphone Addiction Scale Scores According to Parents' Occupations.

The sixth sub-problem of the research is expressed as “Do students' smartphone addiction scale scores show a significant difference according to their parents' occupations?” The total score, mean, and standard deviation values obtained from the scale for fathers' occupations are presented in Table 13.

Table 13. One-way ANOVA results of students' smartphone addiction based on fathers' occupations

Dimensions	n	x̄	Stand Dev	Variance.	Total Squares	sd	Mean Squares	F	p	LSD
Smartphone Addiction										
Unemployed	33	28,48	10,57		432,533	3	144,178	1,196	,314	

Worker	77	24,89	11,21	Between Groups	16877,127	140	120,551
Civil Servant	25	23,44	10,88	Within gr.	17309,660	143	
Retired	9	26,22	10,59	Total			
Total	144	25,54	11,00				

*One Way ANOVA, *<0,05, **<0,01*

To determine whether there is a significant difference in the perceptions of "Smartphone Addiction" based on the occupations of the fathers of the participants, the results of the one-way ANOVA analysis indicated that no statistically significant difference was found in students' perceptions of smartphone addiction according to their fathers' occupations (F: 1.196; p: 0.314 > 0.05).

Findings Related to the Sub-objective Sentence on the Differences in Students' Smartphone Addiction According to Their Mothers' Occupations.

The seventh sub-problem of the research is expressed as “Do students' smartphone addiction scale scores show a significant difference according to their parents' education levels?” The total score, mean, and standard deviation values obtained from the scale for mothers' occupations are presented in Table 14.

Table 14. One-way ANOVA results of students' smartphone addiction based on mothers' occupations

Dimensions	n	x̄	Stand Dev	Variance.	Total Squares	sd	Mean Squares	F	p	LSD
Smartphone Addiction										
1. Not working	109	25,85	10,85	Between Groups	192,808	2	96,404	,794	,454	
2. Worker	20	22,80	9,49	Within gr.	17116,851	141	121,396			
3. Officer	15	27,00	13,85	Total	17309,660	143				
Total	144	25,54	11,00							

*One Way ANOVA, *<0,05, **<0,01*

According to the results, no statistically significant difference was found in the perception of smartphone addiction among students based on their mothers' occupations (F: 0.794; p: 0.454 > 0.05).

Conclusion

In the literature, addiction was previously understood as substance addiction, but recently, its scope has expanded, and research is now focusing on a new type of addiction (Yılmaz et al., 2020). This type of addiction, expressed as behavioral addictions unrelated to substances, involves "repetitive impulses to behave harmfully" (Marks, 1990), and despite the harm it causes to one's life, it is characterized by an uncontrollable desire to exhibit certain behaviors and engage in repeated pleasure-inducing behavioral patterns (Black, 2013; Mann et al., 2017). This addiction manifests itself not in dependence on a substance but in the addiction to a behavior or the feelings experienced when the behavior is performed (Alavi et al., 2011). On the other hand, behavioral addiction also involves excessive behavior accompanied by core addiction symptoms such as tolerance, withdrawal, loss of control, craving, cognitive salience, and mood regulation (Kwon et al., 2013).

This type of addiction is essentially digital addiction, encompassing smartphone addiction, internet addiction, screen addiction, social media addiction, digital game addiction, and an intense desire for various digital media tools (Dilci et al., 2019). People's addictions to technology are being investigated under the titles of internet addiction, technological addiction, computer addiction, virtual game addiction, Facebook addiction, digital game addiction, social media addiction, and importantly, smartphone addiction. In this context, the present research examined the relationship between smartphone addiction and certain demographic variables among adolescents in middle and high school. The World Health Organization (WHO) defines adolescence as the period between 10-19 years, youth as the period between 15-24 years, and those aged 10-24 as young people, while considering these age groups within adolescent health (WHO, 2020). Accordingly, individuals in middle and high school can be considered adolescents.

The data for this research, designed within the general survey model as part of a quantitative study, were collected through the Smartphone Addiction Short Form (SAS-SF). Since the scale scores were normally distributed, parametric test techniques were used to analyze the data. The findings revealed that the level of smartphone addiction among middle and high school students in the central district schools of Hozat was slightly below the level posing a risk ($\bar{X}$=2.59). One of the similar findings in the literature was made by Akyürek (2020) on high

school students. According to this research, although the average score was slightly below the midpoint ($\bar{X}$=2.44), it was still considered significant enough to conclude that high school students were addicted to smartphones. It can be said that the findings of this research align with those of similar studies in the literature. For instance, Mazılı and Gültekmin (2020) found that the majority of adolescents had a level of addiction slightly below the risk threshold. Similarly, Aljomaa, Qudah, Albursan, Bakhiet, and Abduljabbar (2016) reported similar findings in their study on high school students. A study by Çalışkan, Yalçın, Aydın, and Ayık (2017) also found that prospective teachers had a smartphone addiction level close to moderate. In Bağcı's (2018) research, it was found that the students participating in the study had moderate levels of smartphone addiction. A study by Sırakaya (2018) found that associate degree students' smartphone use was at a moderate level. Durak and Seferoğlu (2018) aimed to examine the smartphone usage and addiction levels of 5th and 6th-grade middle school students based on certain demographic variables. According to the results, most students used smartphones mainly for gaming, and more than half of the students were classified as "addicted." Çakır and Oğuz's (2017) study involved 540 high school students. The results revealed that high school students had moderate levels of smartphone addiction and loneliness. Similarly, research by Chen, Liu, Ding, Ying, Wang, and Wen (2017) on smartphone addiction among medical students found that the smartphone addiction rate was 29.3% for women and 30.3% for men, with an overall rate of 29.3%. According to Kwon et al. (2013), students exhibited high levels of smartphone addiction. In a study by Haug, Castro, Kwon, Filler, Kowatsch, and Schaub (2015), 16.9% (256) of students were found to be smartphone addicts. The study by Kahyaoğlu Süt, Kurt, Uzal, and Özdilek (2016) found that university students used their smartphones at high rates, while Mert and Özdemir's (2018) research found that the average smartphone usage rate among participants was above average ($\bar{X}$=3.19).

These findings indicate that secondary school students are at a borderline risk of smartphone addiction, and if preventive measures are not taken, it is inevitable that they will exceed the risk threshold and reach a level of behavioral addiction. This, in turn, is likely to lead to undesirable situations and events reflected in society due to the negative impact on the individual's life.

In conclusion, considering the fact that individuals and society cannot remove digital tools from their lives and instead must use them as a significant necessity, solutions must be developed. These solutions should be implemented at the international and national levels, involving all levels of society, including families, parents, schools, teachers, civil society organizations, and especially the media, which should be equipped with the necessary knowledge and resources on this matter.

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