Exploring the relationship between Secondary School Students' Smartphone Addiction, Cognitive Absorption, and Cyber loafing activities

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Students' problematic internet behaviour is often mentioned concept in the related literature. Even though the related literature concentrated on students' problematic internet behaviour from various perspectives among different sampling groups, most of the studies focused on adults than younger groups. Therefore, the current study focused on exploring the secondary school students' cyberloafing activity, cognitive absorption, and smartphone addiction levels according to the demographic characteristics and determining the relationship between smartphone addiction, cognitive absorption, and cyberloafing behaviours. Data were collected from a total of 808 students enrolled in secondary school in the 2020-2021 academic year. Findings showed that secondary school students' cyberloafing activity levels did not significantly differ in terms of gender, school type, and grade level while they differed in terms of smartphone use time. Furthermore, adolescents' cognitive absorption levels significantly differed in terms of gender, school type, grade level, and daily smartphone use. Students' smartphone addiction levels significantly differed between genders and daily smartphone use time while they did not differ in terms of school type and grade level. It was found that there were positive correlations between cognitive absorption and cyberloafing activity level; cognitive absorption and smartphone addiction level; and cyberloafing and smartphone addiction levels. These results reveal the current situation among secondary school students while examining the levels of smartphone addiction, cyberloafing, and cognitive absorption and their relations.

Introduction

Recent advancements in technology and pandemic conditions that we faced forced people to change their communication habits, methods, and medium. There is a shift from face-to-face to electronic environments in both communication and learning processes. Individuals have various reasons to use the Internet, and due to the variety and opportunities provided by

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it, the usage rates of individuals are increasing. In the literature, the crucial role of internet use in educational settings to obtain lifelong skills is indicated. (Ergün & Altun, 2012), Akkoyunlu (2002). These studies emphasized the necessity of "raising awareness of both teachers and students about correct, safe and effective internet use in schools" (p.39).

In particular, the widespread use of technologies such as smartphones and tablets connected to the Internet and the increasing use of social media by individuals have brought about an increase in research on these technologies. Today's students need to live in a digital world and they need to be prepared for the changing conditions as well. As suggested in ISTE (2016), students need to recognize the importance of benefiting from technology to empower the learning process and to be able to use digital tools to enrich their learning with teamwork by collaborating in learning processes. Binkley et al. (2012) also indicated that information literacy and information, communication, and technology literacy are the accepted skills in 21st-century skills.

Apart from all mentioned dimensions, social media brought an interactive environment that people have the resilience to use these environments easily from their smartphones. The studies focusing on the problematic use of the Internet revealed that social media use and smartphone and internet addiction show an overlap (Carbonell et al., 2018, Carbonell & Panova, 2017). Furthermore, since smartphones have been extensively used among young people, it is also crucial to examine their patterns of use. Cha and Seo (2018) found that middle school students spent most of their time respectively on mobile messengers, surfing the Internet, playing games, and social networks. Another issue this brought is "being constantly available" for many individuals in this context. The issue of being constantly available and the inclusion of technology in educational processes has also brought some in-class negativities, such as overuse of smartphones (Kwon et al. 2013) and the decrease in concentration in class (Sim & Kim, 2011), cyberloafing, and cognitive absorption (Arıkan & Özgür, 2019). Various studies focus on cyberloafing behaviour (Karabıyık, Baturay & Özdemir, 2021; Akbulut, Dönmez & Dursun, 2017; Akbulut et al., 2016; Baturay & Toker, 2015), the relation between cognitive absorption (Tanrıverdi & Karaca, 2018, Hayıt & Dönmez, 2016) academic performance (Wu, Mei & Ugrin, 2018), academic procrastination (Şimşek, 2018), social media use (Şahin, 2020), smartphone addiction (Gökçearslan, Uluyol & Şahin, 2018).

In this study, first, current situation among secondary school students' smartphone addiction, cognitive absorption, and cyberloafing activities according to the different variables (gender, grade level, school type, and social media use) were determined. Then the relationship between students' smartphone addiction, cognitive absorption, and cyberloafing activities were investigated.

Related Studies

Among adolescents, the rate of owning a smartphone is quite high and it is also known that the behaviour of using internet-based technologies in an uncontrolled manner has become more common. A consequence of the extensive use of mobile phones among students brought the smartphone addiction problem. In the literature, no consensus among scholars exists on smartphone addiction term instead problematic smartphone use has become common (Ting & Chen, 2020). According to Choi, Lee, and Ha (2012), this addiction which occurs as a consequence of increase in the use of smartphones causes not only social problems but also influences mental health and school life. Furthermore, Sunday, Adesope, and Maarhuis (2021) explored the effect of smartphone addiction on learning, and they found negative effect on learning performance and academic achievement of learners. Karaca (2017) explored university

students' Internet addiction levels and their relation to daily smartphone usage. In this correlational study, males' scores were higher than those of females according to internet addiction scores, and students' internet addiction scores did not significantly differ among their departments.

As one of the problematic uses of the internet cyberloafing is another term appreciated in the literature. In the literature, there are different definitions of cyberloafing term. Cyberloafing can be identified as "any voluntary act of employees' using their companies' internet access during office hours to surf non-job-related websites for personal purposes and to check (including receiving and sending) personal e-mail" (Lim, 2002, p.677). Cyberloafing is distinct from other types of ineffective work habits (Pindek, Krajcevska & Spector, 2018). Lim (2002) and Lim and Teo (2005) grouped two main activities browsing and e-mailing for cyberloafing activities.

The problematic use of the internet in educational settings is the other issue that engaged the attention of the researchers. Cyberloafing activity in educational settings is generally expressed as either the use of internet technologies unrelated to education (Rana, Slade, Kitching & Dwivedi, 2019), or the use of these technologies during instruction in a way that is not related to the course (Tanrıverdi & Karaca, 2018). Recent studies on cyberloafing have been conducted with people from different age groups; including prospective teachers (Tatlı & Sadık, 2021; Arabacı, 2017), and university students (Akar & Coşkun, 2020), graduate students (Bağrıaçık Yılmaz, 2017), high school students (Gezgin, Arslantaş & Şumuer, 2017). In a parallel view, growing access to ICT in educational settings, as well as personal mobile devices, leads to an extensive range of student cyberloafing habits (Sarıtepeci, 2020).

The cyberloafing and smartphone addiction relationship was explored by researchers (Gökçearslan et al., 2016; 2018). Gökçearslan et al. (2016) also emphasized that self-regulation had a significantly negative effect on smartphone addiction while no effect was found on cyberloafing behaviour (Gökçearslan et al., 2016). Akyol-Güner and Demir (2021) examined how smartphone use affected high school students' nomophobia, anxiety, and self-control and found that the addiction level of the students was moderate and had an effect on nomophobia, self-control, and anxiety.

Since in educational process, it is expected to decrease the problematic use of the internet, to reduce cyberloafing possibilities it is essential to determine how students' cognitive absorption levels affect cyberloafing behaviour. The term cognitive absorption is defined as "a state of deep involvement with software" by Agarwal and Karahana (2000) they proposed five dimensions: "temporal dissociation, focused immersion, heightened enjoyment, control, and curiosity" (p.673). Koçak-Usluel and Kurt-Vural (2009) described these dimensions as time, curiosity, the focus of interest, pleasure, and control. The research on cognitive absorption and cyberloafing behaviour is limited and mostly focused on adults (Gerow, Galluch & Thatcher, 2010; Galluch & Thatcher, 2011; Hayıt & Dönmez, 2016). The relationship between the levels of cyberloafing and cognitive absorption was explored by Hayıt and Dönmez (2016) and they found a positive and significant relationship. Furthermore, Tanrıverdi and Karaca (2018) found no significant difference in cyberloafing scores in the dimension of gender, while cognitive absorption scores significantly differed in terms of gender in favor of males. They have also explored students' cognitive absorption and cyberloafing activity levels in conformity with grade level. No significant difference was found honoring cyberloafing behaviour while a significant difference was found in accordance with cognitive absorption levels in favor of 8 graders. Besides, Gerow, Galluch, and Thatcher (2010) found that cognitive absorption was an internal factor supporting cyberloafing behaviour like multitasking. In another research, Koç

(2019) examined whether there was a difference between university students' online self-regulation levels and cognitive absorption and found that male students' cognitive absorption levels were higher than females. Furthermore, the period of being online affected the cognitive absorption levels (Koç, 2019). Barnes, Pressey, and Scornavacca (2019) examined the differences between users' smartphone addiction and social network services within a cognitive absorption view. They found that users who were addicted to smartphones and social networks experienced higher cognitive absorption (Barnes, Pressey & Scornavacca, 2019).

Even though the related literature concentrated on students' problematic internet use from various perspectives among different sampling groups, most of the studies focused on adults rather than younger groups. Studies focusing on secondary school students while investigating these concepts are limited. Furthermore, adolescents spend more time on their mobile phones and they have a tendency to dysfunctional internet use than the older age groups (Stodt, Wegmann & Brand, 2016). This widespread internet and smartphone use among the younger group also brought problematic internet use in educational environments, hence it is important to reveal cyberloafing, smartphone addiction, and cognitive absorption levels in the learning processes. Since younger groups were less likely to explore groups in the related studies, determining the current situation while examining the effect of cognitive absorption, cyberloafing, and smartphone addiction levels of adolescent students may provide information to find solutions in classroom settings. In line with the stated purpose, it is aimed to throw light on research questions given below.

(1) Do the cyberloafing activity levels of secondary school students differ in terms of different variables (gender, school type, and grade level)?
(2) Do the cognitive absorption levels of secondary school students during the lesson differ in terms of different variables (gender, school type, and grade level)?
(3) Do the smartphone addiction levels of secondary school students differ in terms of different variables (gender, school type, and grade level)?
(4) Is there a significant relationship between the cognitive absorption levels of secondary school students and their cyberloafing activity levels?
(5) Is there a significant relationship between the smartphone addiction levels of secondary school students and their cyberloafing levels?
(6) Is there a significant relationship between the smartphone addiction levels of secondary school students and their cognitive absorption levels?

Methodology

Research Design

In this current quantitative research study, correlation design was used. The purpose of the correlation studies was explained as to uncover correlations between variables to better comprehend the understanding of relevant occurrences than "establishing a cause and effect" (Fraenkel, Wallen, & Hyun, 2012, p.332).

Participants

808 secondary school students (540 females, 268 male) from twelve public and private schools in a rural area participated in the study. As a sampling strategy convenience sampling was used. Participants from different school types (Anatolian, Vocational, Project, and

Anatolian religion high schools) and grade levels (9th, 10th, 11th, and 12th grades) participated in the study voluntarily. The demographic information of the participants was given in Table 1.

Table 1. Demographics of the Participants

	9th Grade		10th Grade		11th Grade		12th grade		Total
	F	M	F	M	F	M	F	M	
Anatolian High School	172	107	97	55	85	24	12	16	568
Vocational High School	13	6	2	1	8	2	38	7	77
Project High School	24	23	25	11	13	7	2	0	105
Anatolian Religious High School	25	0	12	0	8	0	4	9	58
Total	234	136	136	67	114	33	56	32	808

In addition, students' internet and social media use were examined, the majority of the students preferred to use WhatsApp (31,8 %), music and movie platforms (23,4 %), and educational websites (14,9 %).

Data collection process

The data was collected through an online survey. During the data collection, three different instruments; Cyberloafing Scale (Akbulut et al., 2016), the cognitive absorption scale (Koçak-Usluel & Kurt-Vural, 2009), and the smartphone addiction scale for teenagers (Şata & Karip, 2017) were used. To collect the descriptive characteristics of the participants Personal Information Form developed by the researchers was used. The form was checked by two specialists from the Instructional Technology field. The form consists of questions about gender, grade level, school type, the devices students use, and the time spent on smartphones and social media tools.

Instruments

(1) Akbulut et al. (2016) developed a cyberloafing activities scale to measure cyberloafing activities in educational settings. The scale includes 30 items with 5 points Likert type with four sub-dimensions (Sharing-9 items, shopping-7 items, real-time updating-5 items, accessing online content-5 items, and gaming/ gambling-4 items). The Cronbach's alpha reliability coefficient for the CAS is .927. The reliability coefficients for sub-dimensions were as follows: Sharing (.852), shopping (.869), real-time updating (.928), accessing online content (.867), and gaming/ gambling (.727).

(2) Agarwal and Karahana (2000) developed a cognitive absorption scale and Koçak-Usluel and Kurt-Vural (2009) adapted it into the Turkish language. The scale includes 17 items and a 4-factor structure (time, curiosity, focus of attention, and pleasure). The scale is presented with a 10-point Likert-type rating and the items in the scale range from 1= strongly disagree to 10= strongly agree. The Cronbach Alpha was calculated as .923.

(3) Kwon et al. (2013) developed the smartphone addiction scale (SAS) with 33 items and 6 points Likert Type. Şata and Karip (2017) adapted the scale in a shorter version to Turkish culture for adolescents with 10 items, a 6-point Likert type with only one factor. The Cronbach α and McDonald ω values of the scale's validity and reliability as α =.90 and ω =.94. Considering its psychometric properties, the reliability coefficient Cronbach α value of the scale was found α =.91 for this sampling.

Before the data collection process, the ethical committee approval from the university (29/12/2020-039) and provincial directorate for national education for formal permissions were

granted to the researchers. Each participant has been informed about the privacy rules (no identificatory information would be published or shared) and the consent form has been received.

Data Analysis

To perform the statistical analysis, the data was checked whether the normal distribution conditions were met. The skewness and kurtosis values presented in Table 2, were between +1 and -1 showing a normal distribution (Hair et al, 2006).

Table 2. Skewness and Kurtosis Values

	M	SD	Skewness	Kurtosis
Cyberloafing Activity	2.300	.530	.089	-.498
Cognitive Absorption	4.653	2.415	.347	-.905
Smartphone Addiction	2.271	1.018	.704	-.339

Results

Gender

In this correlational study, first students' smartphone addiction, cyberloafing behaviour, and cognitive absorption activity levels were examined according to different variables. The findings showed that the students' cognitive absorption and smartphone addiction activity mean scores significantly differed according to the gender variable while cyberloafing activity scores did not significantly differ. The findings presented in Table 3 showed that male students' cognitive absorption mean scores were higher than the females while females surpassed males concerning overall smartphone addiction scores.

Table 3. Summary of the Independent Sample T-Tests Scores for Each Scale by Gender

	Gender	N	X	SD	T	P
Cognitive Absorption Level	Female	515	4.51	2.35	2.26	.024
	Male	256	4.93	2.52		
Cyberloafing Activity Level	Female	515	2.31	.023	-.787	.431
	Male	256	2.27	.033		
Smartphone Addiction Level	Female	515	2.33	1.02	-2.44	.015
	Male	256	2.14	1.00		

Grade levels

The mean scores on all scales were examined according to the grade level (See Table 4). The mean of secondary school students' cyberloafing activity level was calculated as 2.30 (SD=.53), while their cognitive absorption levels' mean was 4.65 (SD=2.41) and the mean of smartphone addiction level was calculated as 2.27 (SD=1.01). It was concluded that the 10th graders had the highest average in terms of all scales.

To compare students' cyberloafing, cognitive absorption and smartphone addiction mean scores about their grade levels One-way between-group ANOVA was performed. It was found that grade level affected cognitive absorption mean scores significantly at the p<.05 level for the four grade-level [f (3,767) =2.70, p=.044]. However, the grade level did not affect

significantly cyberloafing and smartphone addiction mean scores.

Table 4. Mean Scores for All Scales according to Grade Level

	Grade Level	N	M	SD	F	p
Cyberloafing Activity	9th grade	361	4.59	.027		
	10th grade	189	4.98	.039	3.68	.12
	11th grade	140	4.67	.041		
	12th grade	81	4.09	.62		
	Total	771	2.30	.53		
Cognitive Absorption	9th grade	361	4,59	2,40		
	10th grade	189	4,98	2,39	2.70	.044
	11th grade	140	4,67	2,33		
	12th grade	81	4,09	2,57		
	Total	771	4,65	2,41		
Smartphone Addiction	9th grade	361	2.25	1.05		
	10th grade	189	2.31	1.00	.21	.84
	11th grade	140	2.27	.89		
	12th grade	81	2.22	1.06		
	Total	771	2.27	1.01		

School type

Furthermore, the students' cyberloafing activity, cognitive absorption, and smartphone addiction means were examined by the school type variable. The findings presented in Table 5 show the significant effect of school type on cyberloafing F (3,767) = 3,71, p=.011]. and cognitive absorption F (3,767) = 6,67 p=.00]. mean scores at the p<.05 level for the four school types. However, students' smartphone addiction levels were not significantly different by school type.

Table 5. Summary of the One-Way ANOVA by School Type

	School Type	N	M	SD	F	p
Smartphone Addiction	Anatolian High School	549	2.25	1.00		
	Vocational High School	69	2.30	1.07	.19	.89
	Project High School	100	2.30	.94		
	Anatolian Religious High School	53	2.33	1.18		
Cyberloafing Activity	Anatolian High School	549	2.32	.53		
	Vocational High School	69	2.22	.55	3.71	.011*
	Project High School	100	2.34	.46		
	Anatolian Religious High School	53	2.09	.56		
Cognitive Absorption	Anatolian High School	549	4.76	2.39		
	Vocational High School	69	3.78	2.33	6.67	.000*
	Project High School	100	5.09	2.28		
	Anatolian Religious High School	53	3.82	2.62		

*p<.05

A Tukey post hoc test indicated that the cyberloafing activity mean scores for the Anatolian Religious High school (M=2.09, SD=0.56) were significantly different from the Project High School (M=2.34, SD=0.46, p=.030) and Anatolian High School (M=2.32, SD=0.53, p=.014). However, results obtained from the students from the vocational high school (M=2.22, SD=0.55, p=.455) did not differ significantly from the other school types (See Table 6).

Table 6. Post Hoc Comparisons: Cyberloafing Activity according to School Type

	School type	Mean square	Std. Error	p
Anatolian High School	Vocational High School	.09928	.06745	.455
	Project High School	-.01853	.05741	.988

	School type		Mean square	Std. Error	p
Vocational High School	Anatolian Religious High School		.22875*	.07596	.014
	Anatolian High School		-.09928	.06745	.455
	Project High School		-.11781	.08264	.484
	Anatolian Religious High School		.12948	.09645	.536
Project High School	Anatolian High School		.01853	.05741	.988
	Vocational High School		.11781	.08264	.484
	Anatolian Religious High School		.24729*	.08972	.030
Anatolian Religious High School	Anatolian High School		-.22875*	.07596	.014
	Vocational High School		-.12948	.09645	.536
	Project High School		-.24729*	.08972	.030

*p<.05

Similarly, students' cognitive absorption levels were compared concerning the school type. A significant effect of school type on cognitive absorption levels mean scores at the p<0.05 level for the four school types [f= (3,767) =6.67, p=0.000] were found (See Table7).

Table 7. Post Hoc Comparisons: Cognitive Absorption Levels according to School Type

	School type		Mean square	Std. Error	p
Anatolian High School	Vocational High School		.97579*	.30515	.008
	Project High School		-.33289	.25976	.575
	Anatolian Religious High School		.93717*	.34364	.033
Vocational High School	Anatolian High School		-.97579*	.30515	.008
	Project High School		-1.30869*	.37390	.003
	Anatolian Religious High School		-.03862	.43637	1.000
Project High School	Anatolian High School		.33289	.25976	.575
	Vocational High School		1.30869*	.37390	.003
	Anatolian Religious High School		1.27007*	.40592	.010
Anatolian Religious High School	Anatolian High School		-.93717*	.34364	.033
	Vocational High School		.03862	.43637	1.000
	Project High School		-1.27007*	.40592	.010

*p<.05

Time spent on Internet   per day

The total time spent on the internet (on a smartphone) during a day was examined in the context of cyberloafing activity, cognitive absorption, and smartphone addiction activities. It was concluded that the more time spent on the Internet, the higher scores they got on all the scales. On each scale, the mean scores of the students who spent 4 hours were higher than in the other times (See Table 8).

Table 8. One-Way Anova Results of Cognitive absorption, Smartphone Addiction, and Cyberloafing Scores by Time Spent on the Internet

	Time	N	M	Sd	F	p
Cyberloafing Activity	1-2 hours	230	2.03	.48		
	3-4 hours	291	2.37	.49	46.271	.000
	>4 hours	250	2.45	.52		
Cognitive Absorption	1-2 hours	230	3.76	2.10		
	3-4 hours	291	4.65	2.92	32.583	.000
	>4 hours	250	5.47	2.53		
Smartphone Addiction	1-2 hours	230	1.73	.81		
	3-4 hours	291	2.23	.90	79.85	.000
	>4 hours	250	2.80	1.01		

Correlation analysis

Pearson Correlation coefficient was used to examine cyberloafing activity, cognitive absorption, and smartphone addiction levels relation. Normality, linearity, and covariance assumptions were checked by preliminary analysis. First, the relationship between cyberloafing activity, and cognitive absorption was examined. A positive relation between these two variables (r=0.502, p<0.000) were presented in Table 9.

Table 9. The Relationship between Cognitive Absorption and Cyberloafing Activity Levels

		Cyberloafing	Cognitive Absorption
Cyberloafing Activity	Pearson correlation	1	.502**
	Sig. (2 -tailed)		.000
	N	771	771
Cognitive Absorption	Pearson correlation	.502**	1
	Sig. (2 -tailed)	.000	
	N	771	771

**p<.01

Second, cyberloafing activity and smartphone addiction levels relation was examined. A positive relationship between these variables was found (r=0.421, p<0.000). The detailed findings were presented in Table 10.

Table 10. The Relationship between Smartphone Addiction and Cyberloafing Activity Levels

		Cyberloafing	Smartphone Addiction
Cyberloafing Activity	Pearson correlation	1	.421**
	Sig. (2 -tailed)		.000
	N	771	771
Smartphone Addiction	Pearson correlation	.421**	1
	Sig. (2 -tailed)	.000	
	N	771	771

**p<.01

Third, smartphone addiction and cognitive absorption levels relationship was investigated. A positive relationship was found between smartphone addiction and cognitive absorption levels of secondary school students (r=0.509, p<0.000) presented in Table 11.

Table 11. The Relationship between Smartphone Addiction and Cognitive Absorption Levels

		Cyberloafing	Smartphone Addiction
Smartphone Addiction	Pearson correlation	1	.512**
	Sig. (2 -tailed)		.000
	N	771	771
Cognitive Absorption	Pearson correlation	.512**	1
	Sig. (2 -tailed)	.000	
	N	771	771

**p<.01

Summary of the results

It was concluded that secondary school students' cyberloafing, cognitive absorption, and smartphone addiction levels differed according to different variables. Students' cyberloafing activity significantly differed according to school type, and time spent on the internet (on the smartphone) during the day. Moreover, cognitive absorption levels of students significantly differed according to gender, grade level, and time spent on the internet (on a smartphone) during a day. Third, smartphone addiction levels of students differed according to

gender and time spent on the internet (on a smartphone) during the day while it did not differ according to the grade level, and school type. Furthermore, a positive relationship between cyberloafing and cognitive absorption, cyberloafing, and smartphone addiction, and cognitive absorption and smartphone addiction level were found.

Discussion and Conclusions

The present study investigated the secondary school students' cyberloafing behaviours, cognitive absorption, and smartphone addiction levels with considering both the relationship between them and different variables. Although, gender is considered one of the predictors of cyberloafing (Sarıtepeci, 2020; Dursun, Dönmez, & Akbulut, 2018) and males exhibit more cyberloafing behaviour than females (Metin-Orta & Demirtepe-Saygılı, 2021; Sarıtepeci, 2020; Dursun, Dönmez, & Akbulut, 2018; Baturay & Toker, 2015; Askew et al., 2014; Garrett & Danziger, 2008), in this study gender is not a significant factor. In the literature, similar findings exist regarding gender effect on cyberloafing behaviour among different student groups; vocational high school students (Gezgin, Arslantaş & Şumuer, 2017), and graduate students (Bağrıaçık Yılmaz, 2017). Parallel with the literature, this might be related to the type of cyberloafing and the nature of the participant group (Akbulut et al., 2017, 2016).

Furthermore, the findings showed that secondary school students' cyberloafing behaviour did not differ by grade level. Similarly, Dursun, Dönmez, and Akbulut (2018) found that preservice teachers' cyberloafing scores did not differ in accordance with the grade levels. However, even the cyberloafing behaviour did not significantly differ, the findings showed that 9th and 12th graders demonstrated less cyberloafing than 10th and 11th graders. This finding is contradicted by Baturay and Toker's (2015) study. In their study, they found that in higher grade levels more cyberloafing behaviour was displayed than in lower grades and this was associated with higher confidence (Baturay & Toker, 2015). Even though the grade level is not a significant factor for cyberloafing behaviour in the current study, examining the current situation in the pandemic situation may provide the information regarding the factors that might be associated with the problematic internet behaviour. To explain this difference further studies are needed.

The findings showed that secondary school students' cyberloafing behaviours differed significantly by time spent on the internet and school type. In the literature, online social networking habits (Dursun, Dönmez & Akbulut, 2018), social media spent time, and time spent on ICT on daily basis (Sarıtepeci, 2020) were expressed as predictors of the cyberloafing behaviour. The relation between the total time spent on mobile technologies and cyberloafing behaviour (Baturay & Toker, 2015) and time spent on Internet (Metin-Orta & Demirutku, 2022) and ICT usage (Sarıtepeci, 2020) were also highlighted in the literature. Similarly, Baturay and Toker (2015) concluded that cyberloafing behaviour has been observed more in those who use the Internet every day than in those using it less often. Besides, students' cyberloafing behaviours significantly differed according to the high school type they studied. It was also concluded that the cyberloafing activity levels of Anatolian Religious High School students differed significantly compared to the students in the Project High School and Anatolian High School students. Parallel with these findings, risky internet behaviours and problematic internet use of students studying at Anatolian religious high school were found to be significantly lower than the use of students studying in other high school types (Ünver & Koç, 2017). This situation can be evaluated as student characteristics, teaching methods applied at school, and socio-economic variables may be effective on cyberloafing activity level.

In the current study that focuses on the current situation of secondary school students, different

variables (gender, grade level, daily internet use and school type) were examined for problematic internet behaviours. As Barnes, Pressey and Scornavacca (2019) emphasized that different genders show difference in the perception and definition of technology. The results highlight that male students' cognitive absorption levels were higher than females similar to the findings of Koç (2019), Tanrıverdi, and Karaca (2018). According to Agarwal and Dixit (2020), ubiquitous internet access and digitization have a positive effect on cognitive engagement. In addition, grade level was another significant variable for cognitive absorption. Parallel to this finding, Tanrıverdi, and Karaca (2018) found that grade level was a significant variable for cognitive absorption levels. In addition, a positive relationship was expressed by Çutuk-Akkuş (2021) between cognitive absorption and social media addiction, and the fact that those who use smartphones more experienced more cognitive absorption. Tahir (2021) pointed out attitudes toward the use of the Internet and technological devices increase their cognitive absorption levels and this causes delays in their educational tasks.

The levels of smartphone addiction differed significantly by gender and daily internet use. According to the gender variable, female students' smartphone addiction scores were higher than male students. Parallel to this finding, Sağıroğlu, and Akkanat (2019) found that female students' smartphone addiction scores were higher than males and the daily smartphone usage time variable made a significant difference in the level of smartphone addiction. Similarly, Durak and Seferoğlu (2018) conducted a study on secondary school students' smartphone use and addiction levels. They found a significant difference in students' smartphone addiction levels in terms of daily smartphone usage time and frequency of checking their phone, gender, duration of internet use, and use of social media. Aljomaa et al. (2016), working with university students, found significant differences in their research according to gender and duration of smartphone use. Flanigan and Babchuk (2015) stated that the use of social media negatively affects the academic achievement of students. It is thought that this finding related to smartphone addiction may be because smartphones are more accessible and social networks become widespread, as well as individuals in early age groups using these environments to express themselves socially. It was also determined that no significant difference was found by grade level, the school type. Similarly, Tekin (2012) found that the problematic mobile phone use did not differ significantly according to the grade level.

Moreover, a positive relationship between cyberloafing and cognitive absorption was found. This finding can be interpreted as the increase in students' cyberloafing activities as their cognitive immersion levels increase. Similarly, different studies explore the relationship among the level of cyberloafing activity and the level of cognitive involvement. A positive and significant relationship between students' cyberloafing activities and cognitive involvement levels was found (Hayıt & Dönmez, 2016; Tanrıverdi & Karaca, 2018). Similarly, a positive and low-level relationship among cyberloafing and cognitive involvement levels were found by Arıkan and Özgür (2019).

Within the scope of the fifth sub-problem of the research, a positive relationship between the cognitive immersion levels of secondary school students and their smartphone addiction levels was found. This finding can be interpreted as the increase in students' cognitive immersion levels and the increase in their smartphone addiction activities. When the literature was examined, it was stated in the study conducted by Barnes, Pressey, and Scornavacca (2019) that individuals with smartphone and social network addiction experience an optimal level of cognitive immersion. Besides, Sarıtepeci (2020) determined that high school students' daily social media use time, smartphone addiction, and metacognitive awareness levels were considered cyberloafing behaviour reasons.

Furthermore, a positive relationship between the cyberloafing activity levels of secondary school students and their smartphone addiction levels was found. Sarıtepeci (2020) stated that smartphone addiction is one of the main factors of cyberloafing behaviours. Beri and Gulati (2022) stated that flexibility in internet access and restrictions for websites are necessary for the use of ICT in educational settings. In addition, the importance of informing teachers and parents about the control of internet use for students, low academic performance, loss of time, and concentration was emphasized. Sarıtepeci (2020) concluded that cyberloafing behaviours can be prevented as a result of high school students and teachers providing controlled access to the school network by using some usernames and passwords in the education environment. In parallel, Gökçearslan, Uluyol, and Şahin (2018) concluded that cyberloafing behaviours affect smartphone addiction.

In conclusion, even though there are studies that incorporate cyberloafing and cognitive absorption between adolescents (Tanrıverdi & Karaca, 2018), exploring the relationship between smartphone addiction and cyberloafing behaviour (Gökçearslan, Uluyol & Şahin, 2018), limited studies exist which incorporate these three concepts among the adolescents. Besides, as a result of the pandemic environment, individuals' time spent on the Internet has increased. Since adolescents have been using the internet intensively in recent years and problematic internet behaviours is common among adolescents than the other ages, more studies were required to understand the problematic internet behaviour within these age groups. This study aims to provide the current situation according to different variables. Even though, some descriptive variables did not significantly differ according to the problematic internet behaviour, examining the current situation in the pandemic situation may provide information regarding the factors that might be associated with the problematic internet behaviour. Besides, this study may contribute to the literature with the large sampling and number and scope of the study. To have a better understanding related to the situation among adolescents, further studies can focus on exploring the reasons lying behind these problematic behaviours and the solution practices for schools. Besides, this study may contribute to the literature with the large sampling and number and scope of the study. To have a better understanding related to the situation among adolescents, further studies can focus on exploring the reasons lying behind these problematic behaviours and the solution practices for schools. Moreover, experimental studies can be designed to examine the effect of these variables on smartphone addiction and cyberloafing levels. In the implementation, the rules followed in the environments such as classroom and laboratory environments to reduce improper use of the internet behavior can be specified at the beginning of the semester by taking the students' opinions in the process. In further studies, innovative methods can be used to increase in-class motivation as well as involving students in the decision-making process.

Note

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