Study on Teenagers' Use of Mobile Phones

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ABSTRACT

In today's society, where almost all teenagers in Korea have access to a mobile phone, numerous studies have demonstrated that mobile phone use leads to symptoms of addiction and hinders academic achievement. This paper investigates whether excessive cell phone use does disrupt teenagers' quality of life, leading to sedentary lifestyles or diminished grades. To this end, this study conducted a survey on 43 students in regards to their daily smartphone use. A 9-question survey, querying Korean students on their demographics and daily use of smartphones, was shared via email and other messaging platforms. The collected data was analyzed using SPSS and Excel. Based on the survey, higher-achieving students tend to spend less time on their cell phones overall and more of their screen time is spent on information and news apps. Students with an average level of academic achievement reported a longer average screen time and primarily used social media and entertainment platforms. Among students that reported longer screen times, those with lower grades tended to display signs of addiction more frequently. This study revealed that longer cell phone use is indeed linked to less physical activity, diminished academic performance, and more evident symptoms of mobile phone addiction.

Introduction

In 2023 the Korea Communications Commission conducted a study and reported that 99.6% of all children and teenagers in the country used smartphones (Yeon, 2024). The growing use of mobile phones among adolescents brings light to concerns that teenagers have become largely addicted to their phones. In fact, the average teenager spends 2 hours and 41 minutes on their smartphone and over 8 hours on the Internet every day (Kim, 2024). The Ministry of Science and ICT revealed that the results of a 2024 study found 40.1% of youth, aged 10-19, are at risk of excessive reliance on smartphones (Chae Eun, 2024).

Previous research supports the association of excessive use of mobile phones with serious physical and mental consequences that may diminish the quality of life. According to Bai et al. (2020) mobile phone addiction shows a significant negative correlation with performance in school among teenagers from low-income families and Zhou et al. (2024) found in their study that mobile phone addiction has a noted positive correlation with procrastination among college students. Furthermore, an increase in exercise behavior has been revealed to help decrease mobile phone addiction among children (Wan & Ren, 2023).

The objective of this study was to inquire whether teenagers in international schools are severely addicted to mobile phones. This study investigated the extent to which students overuse their mobile phones and how academic grades, duration of exercise, and other aspects of a teen's life are influenced by phone addiction. The participants of this survey were high school students attending international schools based in Korea.

The questionnaire used in this study included two sections. The first part of the questionnaire inquired about the participant's general background, including daily smartphone usage. For the second part, participants answered how often they exhibit common signs of addiction such as anxiety and neglect in relation to usage or lack thereof. For each section, the study selected two variables to analyze the relationship using Excel and SPSS. The study overall aims to analyze how often a participant manifests signs of addiction is correlated with his or her screen time.

Methods

Overall, this study collected data utilizing the methods described as following. A Google Forms questionnaire was designed to query Korean students on their general background (gender, grade level, academic performance, and level of engagement in physical activities), their daily use of smartphones, how smartphone use influences daily life patterns) and the level at which they display common addiction symptoms (including anxiety and neglect). These questions were to find out how often and how extreme signs of addiction are displayed in people with long average screen times.

The questionnaire was shared via email to the student body of BC Collegiate and to outside students. Students from other schools were asked to fill out the form via messaging platforms Kakaotalk and Instagram. The responses were collected anonymously so students would self-report honestly and each respondent was limited to one submission. Then, beginning in April 2024, the survey was distributed to middle and high school students via email and Kakaotalk. A total of 43 responses were collected throughout the two-month period.

Due to the relatively small sample size, Fisher's exact test was utilized to examine the associations between the variables. The collected data was organized and analyzed using SPSS and Excel was used to analyze the frequency of each sign of phone addiction and its relationship with other variables.

Results and Discussion

This study poses that teenagers are prone to addiction due to their lack of self-restraint relative to adults, as their brains are in the middle of development. The following results will be used to discuss the questions posed by the study.

Current Status of Smartphone Use among Teenagers

This section aims to explore and explain the direct correlation between screen time and several variables that can be influenced by smartphone use**.**

Relationship Between Outdoor Activities and Time Spent on Smartphone
The survey was conducted with the anticipation that students more engaged in athletic activities tend to spend less time on their phones. Due to the small sample size the results were analyzed using the Fisher Exact Test.

Table 1-1. The frequency and percentage of smartphone usage time by students versus level of outdoor activities.

		Time spent on phone per day					
		1 hour or less	1-2 hours	2-3 hours	3-4 hours	4-5 hours	5+ hours
Athletic/ outdoor activities time	**Not at all / rarely**	0 (0)	4.7% (2)	0 (0)	0 (0)	11.6% (5)	2.3% (1)
	1-2 times a week	0 (0)	11.6% (5)	14.0% (6)	9.3% (4)	0 (0)	7.0% (3)

3-4 times a week	0 (0)	7.0% (3)	9.3% (4)	2.3% (1)	4.7% (2)	7.0% (3)
5/+ times a week	0 (0)	0 (0)	2.3% (1)	2.3% (1)	2.3% (1)	2.3% (1)
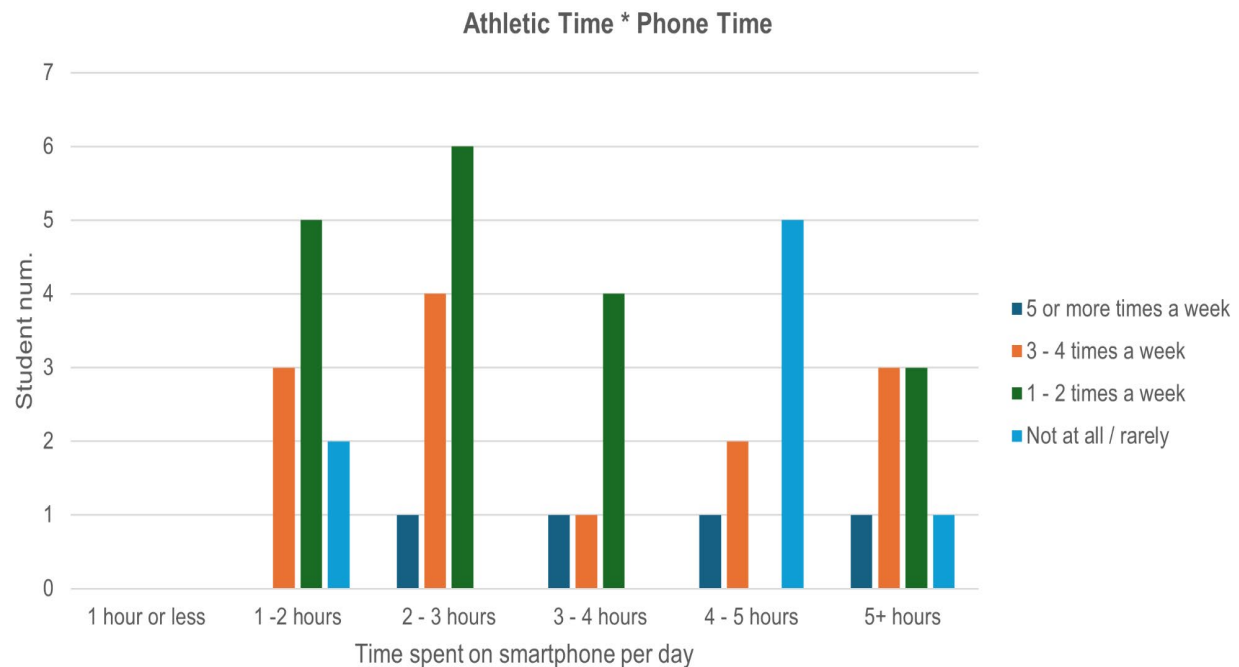
Figure 1-1. The data represented by Table 1-2 has been visualized into a bar graph to show the relation between phone time and level of athletic activity.

In Figure 1-1 it can be seen that the majority of students (75%) who rarely or do not engage in athletic activities spend 4 or more hours on their phones. While the majority of students who are active 1-4 times a week report using their phones less than 4 hours a day. This shows most of the physically active students spend fewer hours on their phones compared with physically inactive students. Therefore, our assumption was proven correct and it can be concluded that less outdoor activity is associated with longer time spent on smartphones.

Relationship Between Gender and Time Spent on Smartphone

**Table 1-2.** Phone usage in hours compared with the gender of students.

		Time spent on phone per day					
		1 hour or less	**1-2 hours**	**2-3 hours**	**3-4 hours**	**4-5 hours**	**5+ hours**
Gender	**Female**	0 (0)	9.3% (4)	9.3% (4)	4.7% (2)	11.6% (5)	11.6% (5)

		0 (0)	14.0% (6)	16.3% (7)	9.3% (4)	7.0% (3)	7.0% (3)
	Male						
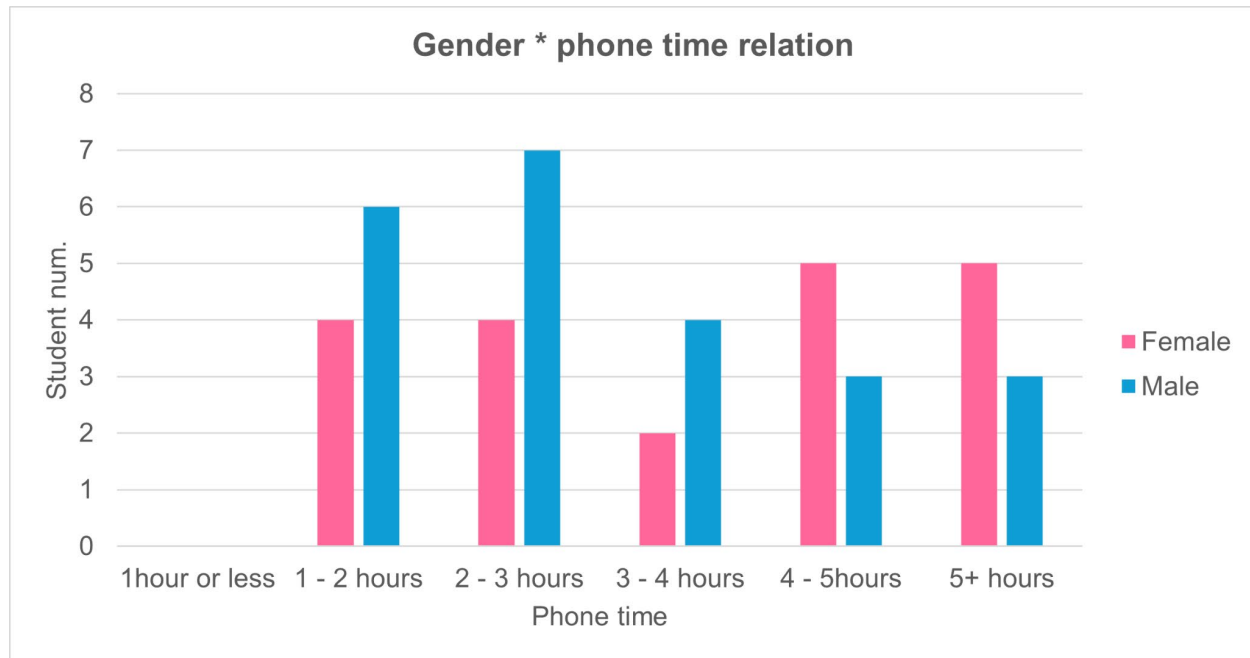
Figure 1-2. The data represented by Table 1-1 has been visualized as a bar graph to show the relation between phone usage time and gender.

Looking at Table 1-2, we can see that 57% of male students reported using their phone 1-3 hours a day compared to 40% of female students for the same category. Only 26% of male students are on their phones for more than 4 hours a day while the same is true for 50% of female students. This leads to the conclusion that on average female students use their phones more often than male students.
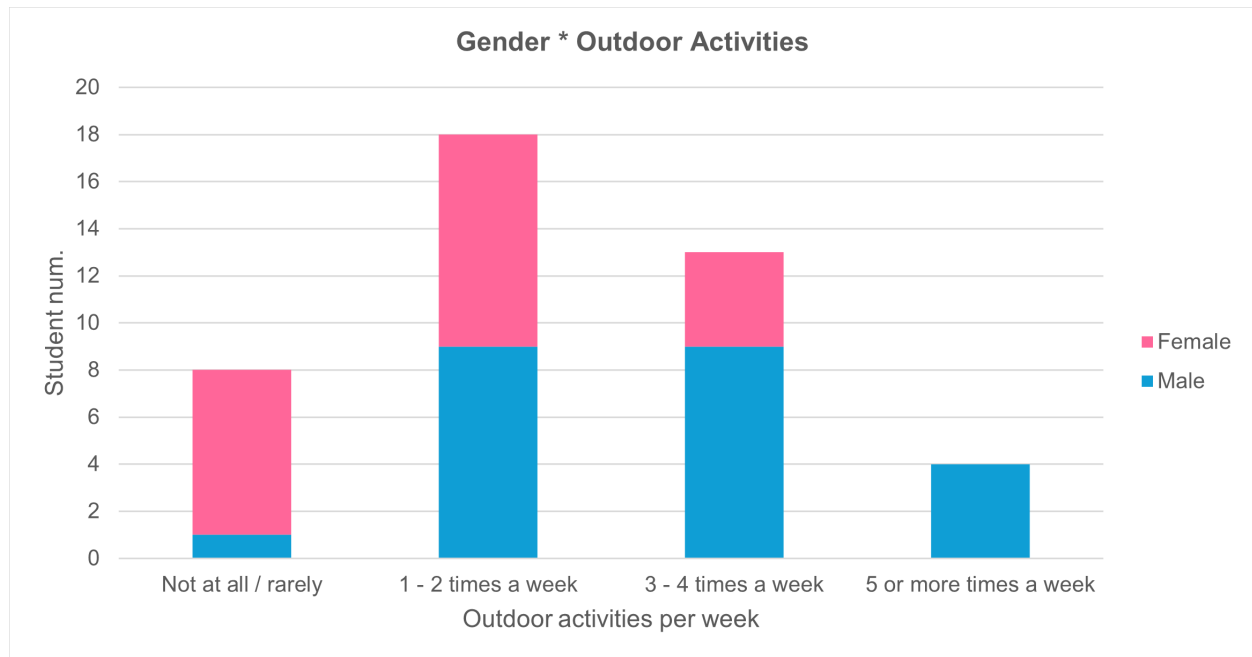
**Figure 1-2-1.** Hours spent on outdoor activity compared with gender

Data displayed in Figure 1-2-1, compares data from sections 1-1 and 1-2 to show that male students spend more time overall on outdoor activities than their female counterparts. This could explain why male students report spending less time on their phones, as they are using more of their time on athletic activities than female students.

Relationship Between Time Spent on Smartphone and Level of Academic Performance

This section investigates the correlation between academic performance and duration of daily smartphone use, the primary purpose of this study.

Table 1-3. The phone usage time compared with academic category, produced by the Fisher Exact Test.

		Time spent on phone per day					
		1 hr or less	**1-2 hours**	**2-3 hours**	**3-4 hours**	**4-5 hours**	**5+ hours**
Academic grade	**Well above average**	0 (0)	11.6% (5)	4.7% (2)	2.3% (1)	0 (0)	2.3% (1)
	Above average	0 (0)	7.0% (3)	11.6% (5)	4.7% (2)	14.0% (6)	7.0% (3)
	Slightly above average	0 (0)	2.3% (1)	7.0% (3)	4.7% (2)	4.7% (2)	7.0% (3)
	Average	0 (0)	2.3% (1)	2.3% (1)	2.3% (1)	0 (0)	0 (0)
	Slightly below average	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4.7% (2)
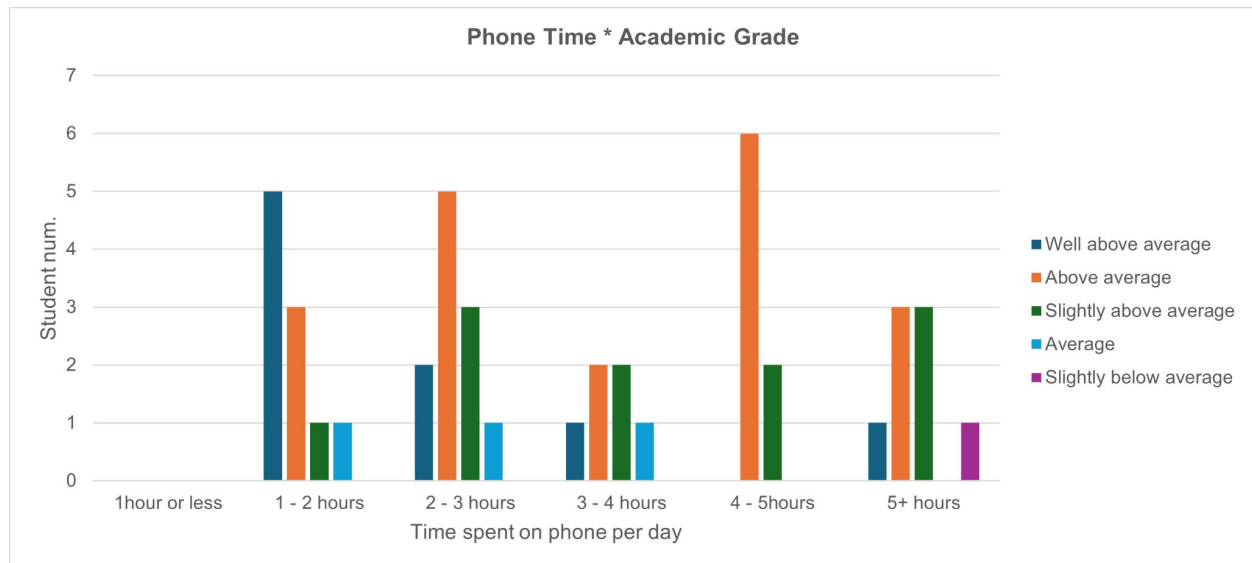
Figure 1-3. The data represented by Table 1-3 has been visualized into a bar graph to show the relationship between phone time and level of academic achievement

Based on Figure 1-3, the largest percentage of high-achieving (well above average and above average) students report using their phones less than 3 hours a day. All other categories were less conclusive with slightly above average students remaining relatively split across all categories. The pools of average and below average students being as small as they are don't allow for any conclusive points to be drawn but the trend points to average students spending a low to average amount of time on their phones per day while below average students spend longer durations.

Relationship Between Most Frequently Used Apps and Gender

Next, an analysis was conducted to find the correlation between gender and the category of frequently used smartphone apps. The tables below display the categories of apps on which male and female students spend the most time on. First, the analysis was conducted on female students.

Table 1-4. Categories of smartphone apps most frequently used by female students.

	Entertainment	Social Media	Game	Shopping	Info
Female			v		
Female	v	v	v	v	v
Female	v	v	v		v
Female	v	v			v
Female	v				
Female	v	v			
Female	v		v		
Female	v				
Female	v	v			
Female					v
Female			v		
Female	v	v	v	v	v

Female		v			
Female	v				
Female		v			
Female	v				
Female		v			
Female	v				
Female	v	v			
Female	v				
Total	14	10	6	2	5

Table 1-4-1. Categories of smartphone apps most frequently used by male students.

	Entertainment	Social Media	Game	Shopping	Info
Male					v
Male	v				
Male					v
Male			v		
Male	v				
Male	v				
Male					v
Male	v	v	v	v	v
Male	v	v			
Male		v			
Male					v
Male	v	v			
Male	v	v	v	v	v
Male	v		v		v
Male	v				
Male		v		v	
Male		v			
Male		v			
Male					v
Male		v			
Male	v				
Male	v				
Male		v			
Total	11	10	4	3	8

Frequenly Used Apps * Gender
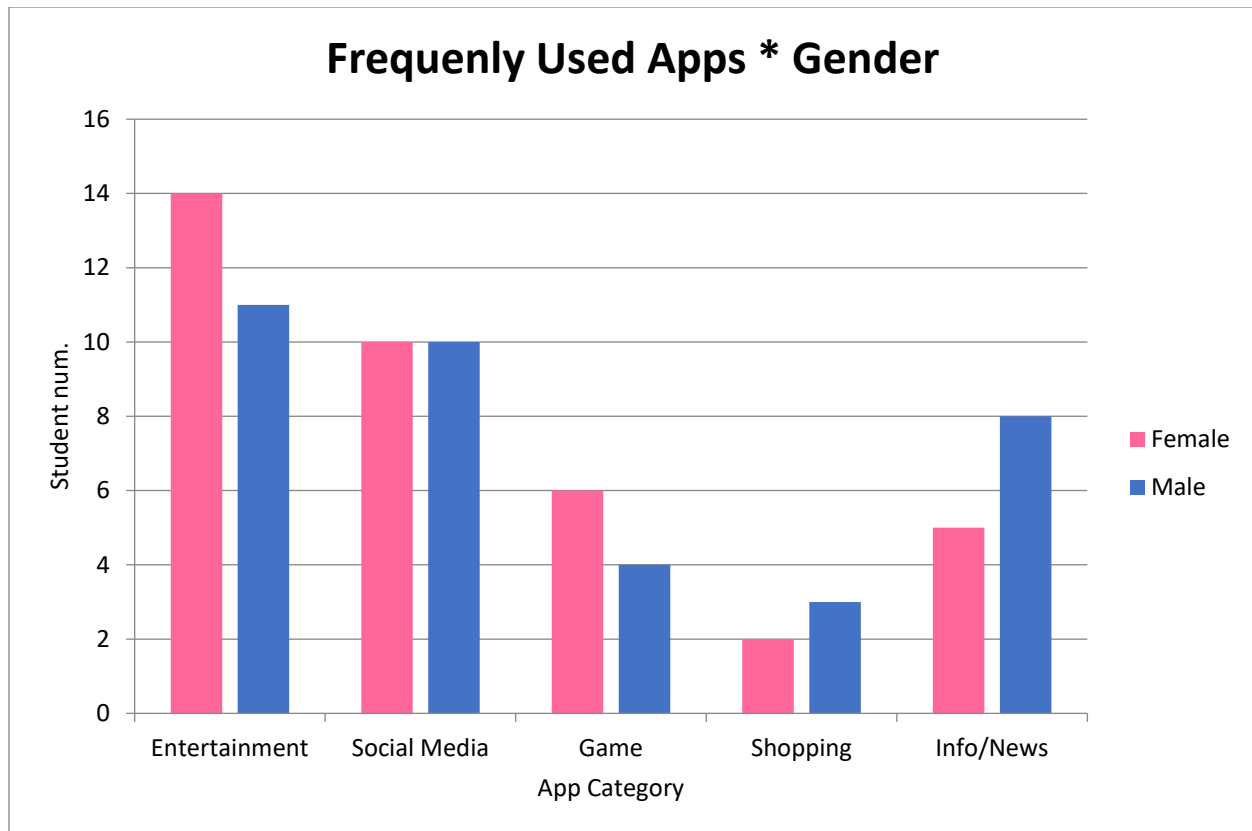
Figure 1-4. The data represented by Tables 1-4 and 1-4-1 has been visualized into a bar graph to show the relationship between frequently used app categories and gender

Table 1-4 shows that female students tend to spend the most time on 1) entertainment, followed by social media and 3) games. The results in Table 1-4-1 revealed that male students on average spent the most time on entertainment apps, followed by 2) social media and 3) information/news. It can be concluded that students commonly spend the majority of their screen time on entertainment and social media platforms.

As shown in Figure 1-4, all students, regardless of gender reported spending the most time on entertainment and social media apps. Female students overall reported more varied usage of apps and were more likely to select more than one category of app. Only 60% of female students chose a single app category, whereas 74% of men reported the same. It also must be noted, that as the data size is small the results may not be fully representative. Male students play a lot of games but they mainly play on computers so that could potentially explain why their cell phone usage is lower when compared with their female counterparts.

Relationship Between Most Frequently Used Apps and Academic Performance

This section explores which category of smart phone application students use most often depending on their academic performance. This analysis identifies the differences in the apps that various groups of students, classified by academic achievement, use the most.

Table 1-5. App categories used most frequently by well-above-average students versus used by above-average students.

	Entertain-ment	Social Media	Game	Shopping	Info
Well above average	v				
Well above average					v
Well above average			v		
Well above average	v	v	v	v	v
Well above average					v
Well above average	v	v			v
Well above average	v				
Well above average	v	v	v	v	v
Well above average	v				
Above average					v
Above average			v		
Above average	v	v			v
Above average	v				
Above average					v
Above average	v	v			
Above average	v	v			
Above average	v	v			
Above average					v
Above average			v		
Above average	v	v	v	v	v
Above average	v		v		v
Above average	v				
Above average		v		v	
Above average		v			
Above average	v				
Above average	v				
Above average		v			
Above average	v				
Total	17	11	7	4	11

Most Used Apps among High-Ranking students
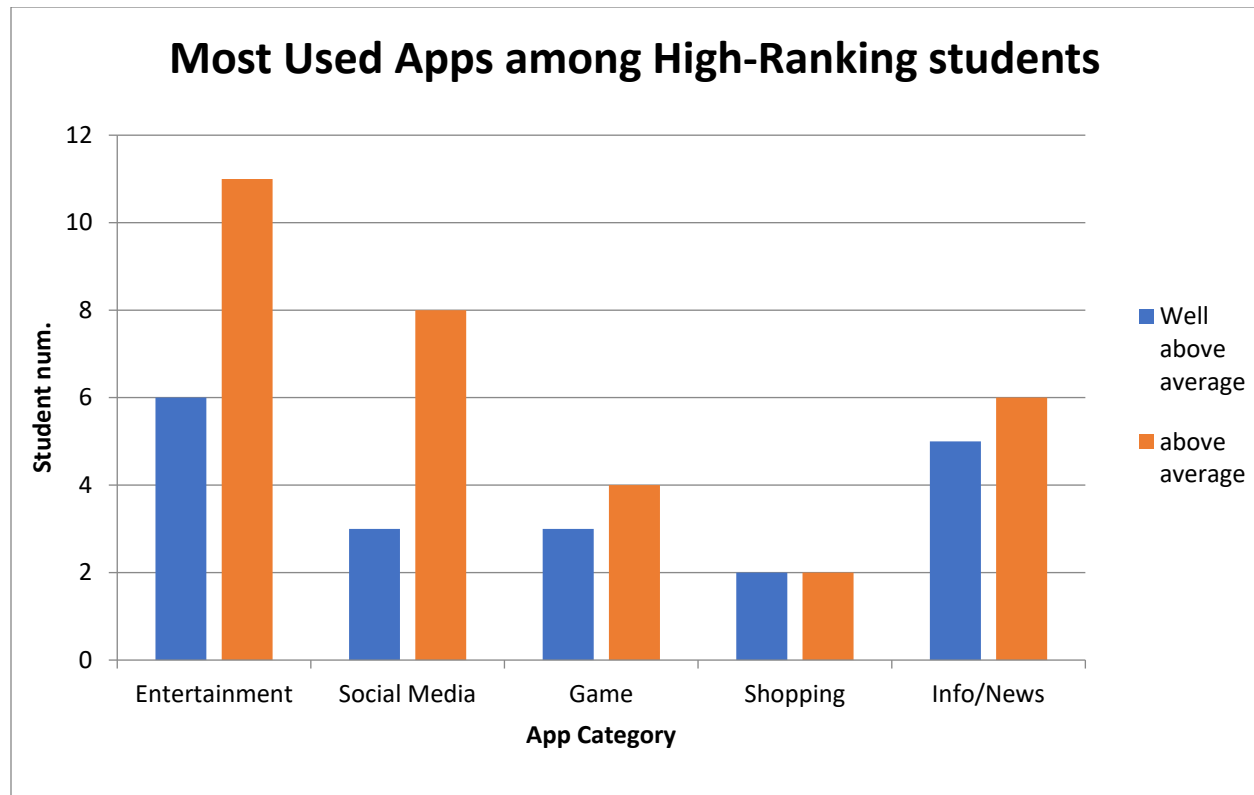
Figure 1-5. The data represented by Table 1-5 has been visualized as a bar graph to compare the most used app categories among high-ranking students.

Table 1-5-1. App categories used the most frequently by relatively lower-ranking students (average and slightly below average).

	Entertainment	Social Media	Game	Shopping	Info
Average	v				
Average		v			
Average		v			
Slightly below average	v		v		
Slightly below average		v			
Slightly below average		v			
Total	2	4	1	0	0
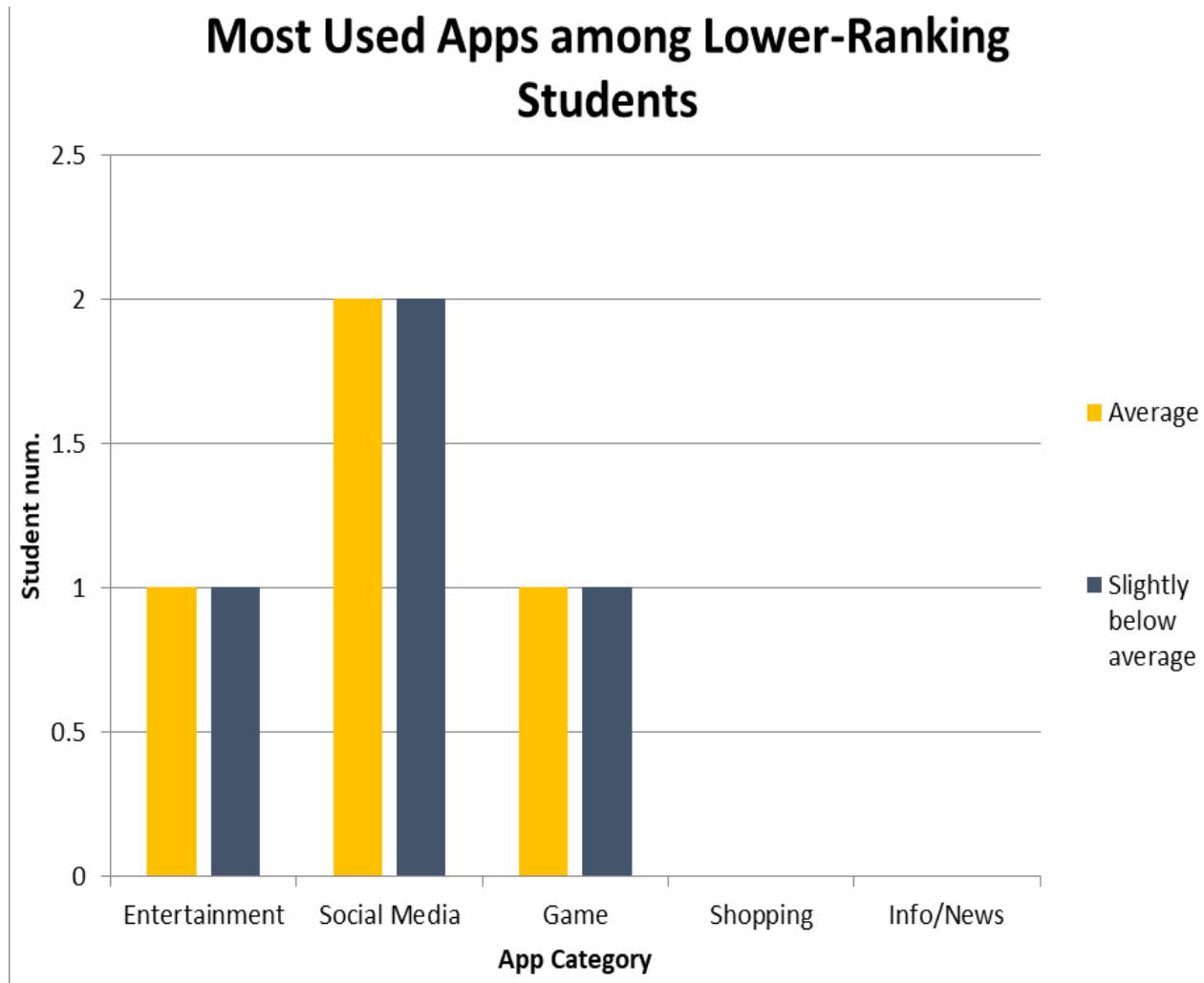
Figure 1-5-1. The data represented by table 1-5-1 has been visualized as a bar graph to compare the most used app categories among lower ranking students.

As per the data displayed in Figure 1-5, high-ranking students tend to spend the most time on entertainment platforms, followed by social media and news applications. It was unanticipated that top-ranking students typically spent a notable amount of time on information and news apps.

Figure 1-5-1 shows that the primary category of usage for lower-ranking students was social media, followed by entertainment. Higher-ranking students tended to spend more time on the information and news apps as well, which lower-performing students rarely used. However, due to the small sample size, the category may not be fully represented.

Degree of Addiction Based on Gender, Time Spent on Smartphone, and Academic Performance

This study aimed to understand cell phone addiction through signs that appear as consequences of long-term smartphone use. Therefore, this study created a questionnaire to find out how extent to which addiction symptoms manifest is linked to gender, academic performance, and screen time. In order to compile the results, each item was assigned a number between 1 and 5. "Never / rarely" was expressed as a score of 1; "frequently" was expressed as a 5. Therefore, students with a greater sum of all the scores meant they were more severely addicted to smartphone use.

Relationship Between Degree of Addiction and Gender
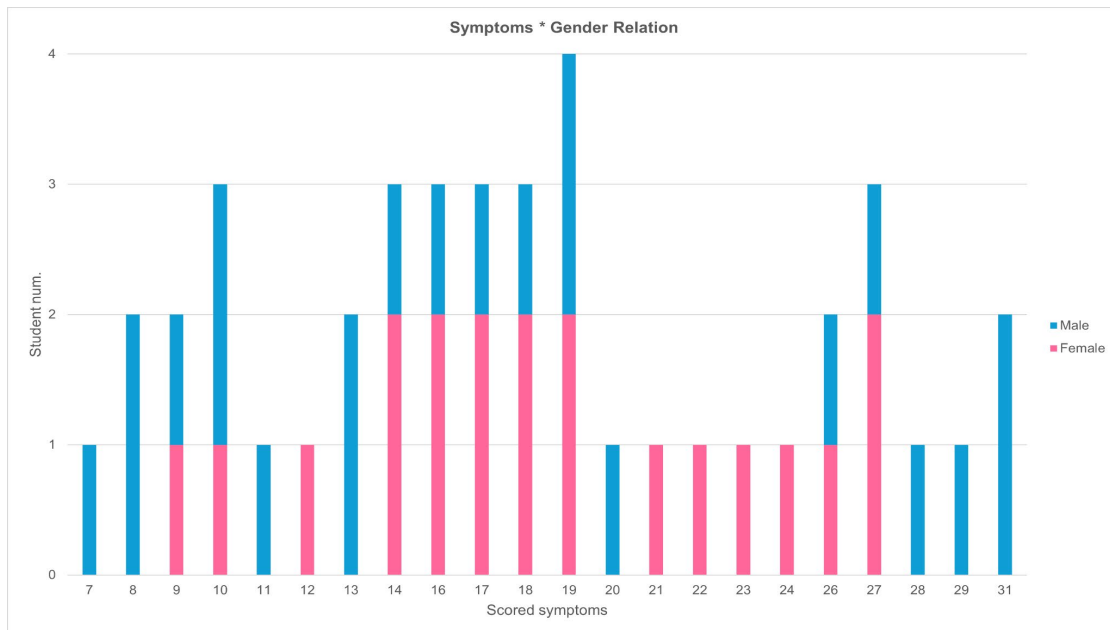
Figure 2-1. Gender compared with degree of addiction.

Upon analyzing the relationship between gender and symptoms of addiction in Figure 2-1, there seems to be no notable pattern between the two variables. We expect this result to be due to the small sample size.
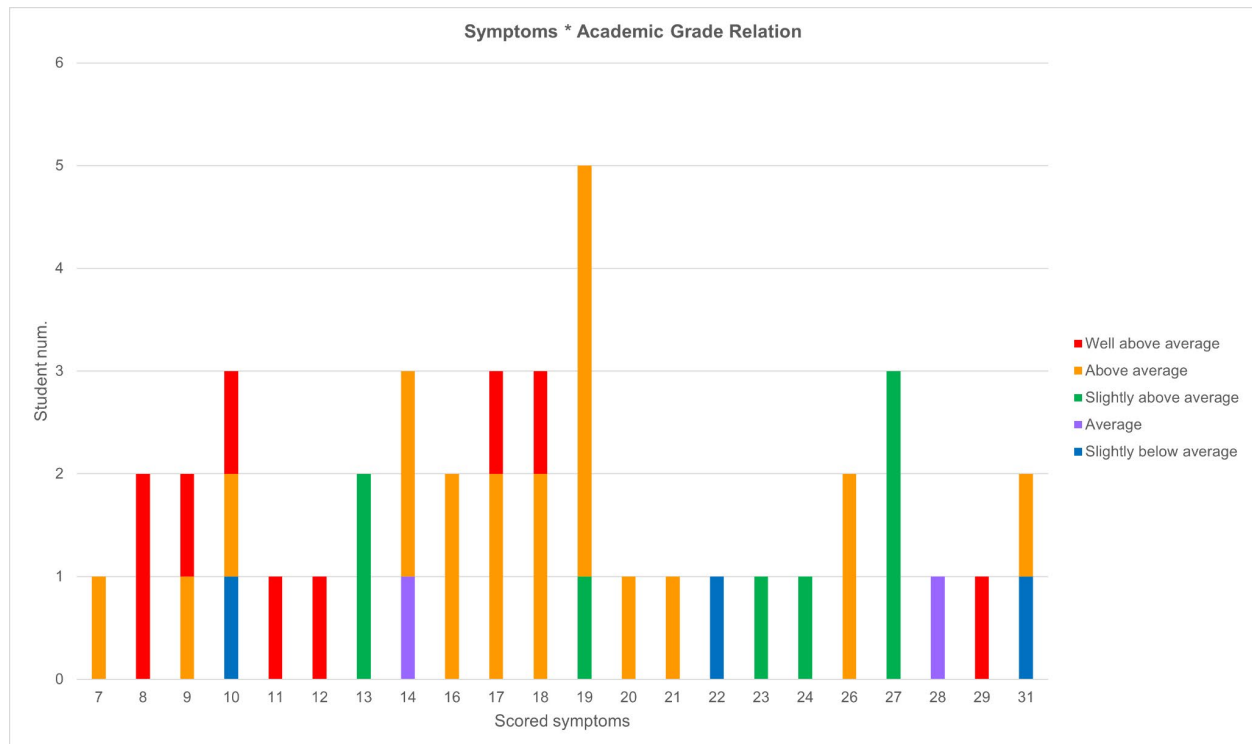
Relationship Between Degree of Addiction and Time Spent on Smartphone
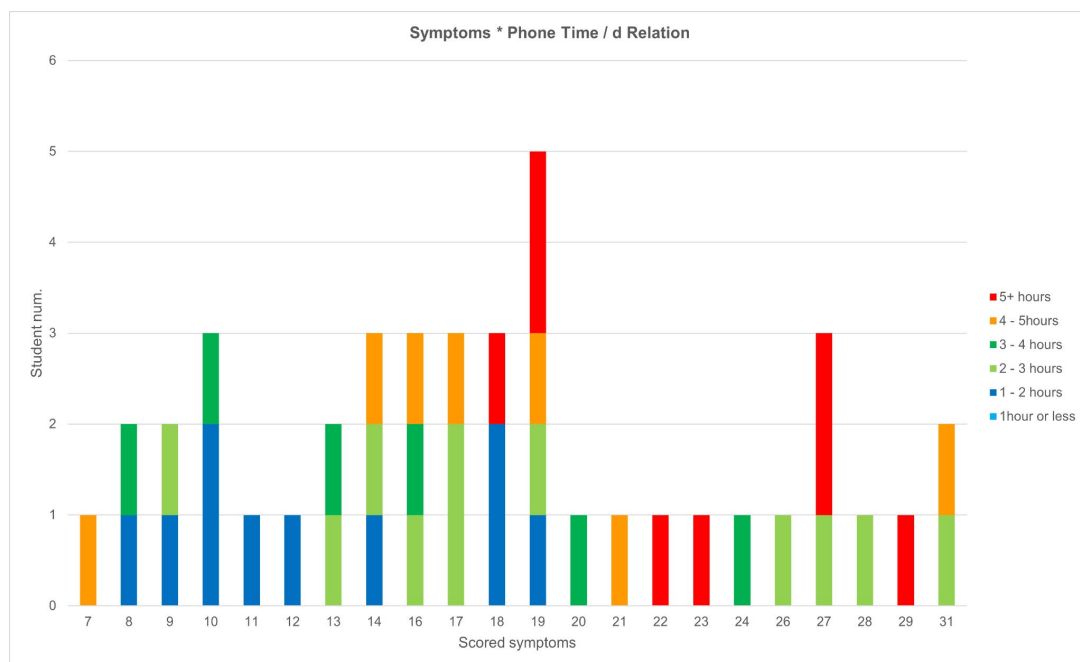
Figure 2-2. Phone screen time compared with degree of addiction.

Figure 2-2 shows an analysis to determine whether smartphone usage is linked to more serious addiction symptoms. Students showing fewer symptoms tend to spend less time on smartphones. Those showing more signs of addiction tend to use their phones for longer hours. In other words, the longer the mobile phone screen time, the more signs of addiction the students display.

Relationship Between Degree of Addiction and Academic Performance

Figure 2-3. Degree of addiction compared with level of academic performance.

The analysis displayed in Figure 2-3 explores the relationship between students' addiction symptoms and academic performance. The results reveal that symptom integration scores of well-above-average students are low in average and are skewed to the left. The conclusion can be drawn that very high achieving students display fewer signs of mobile phone addiction.

Conclusion

The study aimed at extending the understanding of how screen time is linked to students' academic performance, activity levels and how those factors affect their degree of displayed addiction. Based on the survey, higher-achieving students tend to spend less time on their cell phones overall and spend more time on information and news apps compared with their peers with lower levels of achievement. Students with an average level of academic achievement reported a longer average screen times and primarily used social media and entertainment platforms. Among the students with relatively longer screen time, those with lower grades tended to more frequently display signs of addiction.

This study revealed that longer cell phone use is indeed linked to less physical activity, diminished academic performance, and more evident symptoms of mobile phone addiction. In relation to addiction, it was found that students who spend less time on their phones reported lower degrees of addiction when compared with those with higher screen times. Additionally, students with higher levels of academic achievement reported lower degrees of addiction; however, due to the lack of data the difference was not drastic and results may not be fully representative of the category.

The participants generally come from upper or upper-middle class families in high income brackets. Hence, these students grew up in similar academic and social environments throughout childhood. The results demonstrate a notable correlation between the frequency of addiction symptoms and screen time. It can also be noted that teenagers of the same economic background have widely varying patterns of smartphone use and prefer different apps.

Due to the small sample size of this study, results cannot be fully conclusive. In repeating this experiment in the future with a larger sample pool it would be preferable to ensure a wide range of students are sampled including those with various levels of academic achievement, as well as those from different academic and socioeconomic environments.

As this study was conducted through self-reporting and there is the possibility of error due to students misrepresenting their usage. To mitigate this, a possibility for a future study could ask students to directly send screenshots of their mobile phones reported usage information. Additionally, since student's usage time was not divided or ranked by app, there is no way to determine which categories were used for the most collective hours, just which were used often. In a future study it would be good to take the opportunity and have participants rank or otherwise indicate their usage time by app.

This study concludes that high achieving students, regardless of gender have shorter screen times and therefore display fewer signs of mobile phone addition. Further study into the connections between symptoms of addiction and screen time in relation to academic achievement are needed to strengthen the correlations.

Acknowledgments

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