

Effect of Multi-Screen Addiction on Sleep Quality and Self-Control among Preparatory School Students

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Abstract

The growing trend of multi-screen use among preparatory school students raises concerns about potential addiction. While mobile touchscreen devices (smartphones and tablets) are ubiquitous, we lack a clear understanding of how these students use them and why this behavior is on the rise. **The aim of this study:** is to examine the effect of multi-screen addiction on sleep quality and self-control among preparatory school students. **Subjects and Methods:** A study design that was cross-sectional was employed. In this study, 300 students from certain preparatory schools connected to Minia City of Minia Governorate were included in a multistage random sample. Four tools were used in this research involved; 1st tool: A structured interviewing questionnaire, first Part: Demographic Characteristics Questionnaire, second Part: multi-screen history, 2nd Tool: a multi-screen addiction scale, 3rd Tool: the Pittsburgh Sleep Quality Index, and 4th Tool: Brief Self-Control Scale. **Results:** More than half of the studied sample had high multi-screen addiction; the majority of them had unsatisfactory sleep quality and low self-control levels. Also, there was a highly statistically significant correlation between multi-screen addiction and studied sample sleep quality and their self-control level. **Conclusion:** A current research highlighted that multi-screen addiction improved among preparatory school students as well as its impact reversely on their quality of sleep and self-control. **Recommendation:** Preparatory students need continuous education on multi-screen use. Programs can teach responsible digital habits, including time management and identifying both the risks and benefits of multi-screening, to empower students for success.

Keywords: Preparatory school students, self-control, multi-screen addiction, sleep quality.

Introduction:

These days, the most vital tools in our everyday lives are gadgets with displays (TV, Smart Phone, Tablet, PC, etc.) that allow us to access a variety of multimedia content (Santos et al., 2024). People become more dependent on their mobile devices and the Internet services they access since they utilize them for so many different everyday activities and tasks (Tang et al., 2024). Addiction to smartphones and the Internet is categorized as a form of behavioral addiction (Méndez et al., 2024).

Our most valuable resource and future hope are the pupils in our schools. In addition, infancy lays the groundwork for later stages of life. One's formative years are during the adolescent era of life. The body and brain develop quickly, and this fast maturation results in significant gains in social and familial interactions, academic achievement, attitudes, and physical attractiveness (Ahmed & Gil-Lopez 2024). During this time,

sleep is essential because it helps teenagers reach their maximum potential by operating in the background. The National Sleep Foundation and the American Academy of Sleep Medicine state that adolescents require eight to ten hours of sleep every night (Güleç, 2024). By receiving this suggested amount of sleep, adolescents can maintain their academic achievement, emotional health, and physical health (Pavlopoulou, 2021).

Multimedia misuse may affect many aspects of life, including family dynamics, education, and academic decline. It can also have a negative impact on one's physical and developmental health due to sedentary behavior and poor self-care (Vistari, 2023). There is a chance of developing a multi-media addiction due to the increasing use of multi-media and quick internet access (Hosny, 2023), It is defined as the excessive and recurrent use of multimedia to the point where it obstructs other facets of daily living. The definition of social media addiction (IA) is "an impulse-control condition that does

not require an intoxicant." (Hörmann et al., 2024).

A problematic and reliant attitude toward a variety of screen activities is referred to as screen addiction (BULUT & GOKCE 2023). Screen addiction is thought to have several subtypes, including internet addiction (gambling, purchasing, sexuality, etc.), digital game addiction (online, offline, single-player, multiplayer, depending on the genre), media addiction (traditional media, social media), and technical device addiction (computers, television, smartphones, tablets, VR, and so forth) (Chang et al., 2023). Three dynamics-digital interaction, virtual environment, and screen-are common in these subtypes and can individually or in combination cause addiction (Kim et al., 2020). As a result, multi-screen addiction (MSA), which includes internet and smartphone addiction, is classified as a behavioral addiction. Due to the fact that multiple screen users frequently lose control and become behaviorally addicted (Gökçearslan et al., 2021).

Multimedia use among adolescents has become ingrained in their daily lives. Teens spend a lot of time in front of devices, which might cause problems for their families (Shannon et al., 2022). Concerns over teens' reliance on digital displays to satisfy their emotional needs are raised by the pervasive use of these devices, which are mostly found in bedrooms. Overuse of multimedia might alter sleeping and waking patterns, which can hinder academic performance. Moreover, repeated teenage depressive episodes and sleeplessness have been linked to multi-media (Megawati et al., 2023).

Being able to control oneself is crucial for teenagers. This period of life is already challenging due to various social and biological factors (Rosmalina et al., 2023). When teenagers lack self-control, it can make it even harder for them to navigate these problems (Burnell et al., 2023). Additionally, since self-control skills developed during childhood as well as adolescence can impact someone's entire life, it's especially important for teenagers to develop these skills. This is why it's crucial to understand how teenagers behave in situations requiring self-control and how those behaviors relate to their overall ability to control themselves (Javakhishvili & Vazsonyi

2021). This study aims to shed light on the effect multi-screen addiction (MSA) and self-control in teenagers.

By creating and drafting training programs for young people to assist them in identifying the causes, impacts, and remedies of multi-screen addiction as well as outlining the most effective methods to use multi-screen usage, the nurse will contribute to the reduction of multi-screen addiction.

Significance of the study

The number of young people in Egypt is rapidly increasing. Teenagers (ten out to nineteen years old) comprise approximately seventeen million people, or about Nineteen percent of the population. (UNICEF Egypt, n.d.).

The majority of people who use computer displays are teenagers. According to a survey done in Egypt, 69.6 percent of 333 preparatory students use electronic devices on a daily basis (Nafee et al., 2018). The survey also showed that 46.3 percent of students had a serious smartphone addiction.

Furthermore, a research study carried out in Egypt to evaluate Facebook and Internet addiction among Egyptian students found that students are more likely to experience problematic Internet use and, to a lesser degree, Internet addiction, both of which have a negative impact on their academic performance (Saied et al., 2016). Numerous research have shown that there is variation in the prevalence of electronic screen addiction among teenagers.

According to a recent study conducted in Egypt, social addiction is prevalent among students at Al-Azhar University and is negatively correlated with sleep quality (Gammal et al., 2019). Addiction to multiple screens is associated with a host of behavioral, relationship, health, and success issues. Understanding the origins, impacts, and therapies of social media addiction is so essential (Hou et al., 2019)

Aim of the study

Examine the effect of multi-screen addiction on sleep quality and self-control among preparatory school students.

Research questions:

- Q1: What is the level of preparatory school students' multi-screen addiction, sleep quality, and self-control?
- Q2: Is there correlation between multi-screen addiction and sleep quality?
- Q3: Is there correlation between multi-screen addiction and self-control?

Subject and Method**Research Design and Setting**

Utilizing a descriptive correlational research approach, the current study's objective was met. Two government preparatory schools in Southern Egypt (Minia City of Minia Governorate), are affiliated to the Ministry of Education.

Sample

In this study, we employed a multistage random sampling approach to recruit participants. Our target population was school-aged children between 12 and 15 years old. To ensure sufficient statistical power, we conducted a G*Power analysis (F test, two groups) assuming a medium effect size and a power level of .05. This analysis indicated a minimum sample size of 300 participants.

We randomly selected two preparatory governmental schools in Minia governorate. Within each school, three classes were chosen at random from a list encompassing grades 1 to 3. A total of 360 students were initially approached. After applying the inclusion criteria, 315 students were eligible for participation, and 300 ultimately consented (resulting in a response rate of 95.3%). This final sample size (n=300) met the requirements established by the a priori power analysis.

Inclusion criteria

The study included students of both sexes between the ages of twelve and fifteen who may have smartphones or tablets and who, in accordance with the American Academy of Pediatrics' (2016) recommendations for the use of smart devices, spend the majority of their time on electronic displays (more than two hours).

Ethical considerations

Official consent was acquired from the headmasters of the preparatory schools in Al

Salam and January 25th, as well as from the educational directorate and educational zones. Parents' and kids' consent was required for voluntary research participation. Every kid and parent who decided to take part in the study gave their informed permission. Students' privacy and data confidentiality were protected. The kids gave their oral consent so they could take part in the research. To protect the pupils' anonymity, the researchers generated code numbers and stored them. Students were informed of the goal of the study in order to win their participation and streamline the data gathering procedure. Two months were dedicated to gathering data.

Data collection tools

The investigators devised and translated a structured interviewing questionnaire into Arabic in order to collect data following a thorough study of the literature. It included the following four tools:

Tool I: Structured interviewing questionnaire**the 1st Part: Demographic Characteristics questionnaire**

Covers the data relevant to general traits as age, sex, educational grade, birth order, family type, residence, parent's occupation and parent's education.

the 2nd Part: multi-screen addiction history

Which involved the duration time for daily use of electronic devices, time of electronic devices utilization, frequency of daily use electronic devices, what is the essential app used, the causes for usage of electronic devices, ability to utilize all choose of electronic devices without assist and the electronic devices are usually used.

Tool II: Electronic Screen Addiction Scale

The researchers designed it following a survey of pertinent national and international literature. It was created using **Saritepeci, (2021)**. Preparatory school pupils' addiction to electronic screens was evaluated using the newly developed instrument. There were twenty-seven things in all. Three domains were identified on the scale: loss of control twelve items), obsessive behavior fifteen items), and

excessive screen time (five items). Expert psychiatric and pediatric nurses examined the content validity of the Arabic version of the Electronic Screen Addiction Scale and made revisions.

Scoring system

The tool used 3-point Likert scale, categorized from strongly agree equal three, neutral equal two, to disagree equal one. The range of total scale scores was twenty-seven to eighty-one. High ratings indicated that preparing pupils were very addicted to electronic screens. The levels of addiction to electronic displays were assessed using the following scores: less than forty (less than fifty percent) was deemed low addiction, severe addiction (sixty–eighty-one, equal or more seventy five percent), and moderate addiction (forty to less sixty, fifty percent to less seventy five percent). The created tool's internal consistency was measured using Cronbach's Alpha, and the result was (0.774).

Tool III: The Pittsburgh Sleep Quality Index (PSQI)

This instrument was created by **Buysse et al. (1989)** and **Shochat et al. (2007)** to evaluate the quality of students' sleep. The researcher translated it into Arabic. There are seven parts to it. 1) Personal assessment of sleep quality 1) Sleep length; 2) Habitual sleep efficiency; 3) Sleep latency; 4) Sleep disruptions; 5) Sleep medicine usage; and 7) Dysfunction throughout the day.

Scoring system

The PSQI has a total of 21 scores. A total score of five or less indicates good sleep quality, whereas a score of five or more indicates inadequate sleep quality. The student answers were on the following zero to three, or scales:

- Not occur during the past month = 0
- Occur once only/ week = 1
- Occur twice times/week = 2
- Occur three times/ week = 3

Tool IV: Brief Self-Control Scale (BSCS):

It was created by Tangney & Boone (2004) to evaluate an individual's capacity to govern their own actions and temperament in specific scenarios, such as "I can work productively

toward long-term goals" and "I frequently act without considering all the options." This self-control tool helps people with their accomplishments, self-control, psychological adaptation, interpersonal relationships, moral emotions (like guilt and shame), and personality traits (like conscientiousness and perfectionism) by promoting their behaviors and subsequently their psychological conditions. Thirteen items total, ranging from one (not at all like me) to five (very much like me), on a 5-point Likert scale. The item's positive 1, 7, 9, and 13 distributed in the Likert scale from one to five while the keeping items are opposite.

Scoring system

The overall score varied from thirteen to sixty-five, with higher values indicating more capacity for psychological adaptability and self-behavioral control. The overall score was determined and categorized as follows: moderate self-control = thirty-three to fifty-three (50–75%), strong self-control = fifty-four to sixty-five ($\geq 75\%$), and low self-control = less than thirty-two ($< 50\%$) (**El Salamony et al., 2023**).

Content validity

A panel of five pediatric and psychiatric nursing specialists evaluated the instruments' content validity. The instrument's topic coverage, clarity, language, length, format, and general look were to be evaluated by each of the expert panels.

Reliability

In order to verify the consistency of the tool, reliability testing was done on the research instruments. By using Cronbach's alpha test, the internal consistency of the instruments was determined to be 0.774, 0.905, and 0.802, respectively. This indicates how closely the instruments measure the same notion and correlate with one another.

Pilot study

Prior to beginning data collection, a pilot study involving thirty students (ten percent of the total sample) was conducted to evaluate the tools' usability, visibility, and clarity; to determine the tool's relevance; to estimate the

amount of time needed to complete the questionnaire; to identify any issues that might cause issues; and to develop the final form. They were a part of the sample under study.

Data collection procedure

A data collecting tool was translated from English into Arabic before data was gathered, and then back into English from Arabic to make sure the original meaning was kept.

The research that collected the data was conducted during April and May of 2024. Using a standardized interview questionnaire sheet, the researcher collected data at official work hours on four days on average over the preceding setting. The researcher greeted each student at the start of the interview, using appropriate channels for communication, stated the goal of the study, and obtained their oral agreement before including them in it and outlining its advantages. Each individual who agrees to engage in filling out the questionnaire does so voluntarily, and there are no expenses or dangers associated with it.

The questionnaire took the researcher twenty to twenty-five minutes to complete. Lastly, the researcher expressed gratitude to the subjects for their assistance.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) version 26 for Windows was used to examine the data that had been gathered. Frequencies and percentages, mean and standard deviation, and the Chi-square test were used in the collection, tabulation, and statistical analysis of the data. The computation of the correlation coefficient (r) was done for continuous variables. Three levels of significance testing were applied: * significant $P < 0.05$, ** very significant $P < 0.01$, and insignificant (NS) $P \geq 0.05$.

Results:

Table (1): shows (35.3%) of the studied sample their age was 14-year-olds., males were the predominant group, making up (65.3%) of the participants. In terms of education, (71%) were in the 2nd preparatory grade. Examining family structure, (42%) were the second child in their family. Notably, (85.4%) belonged to nuclear families, and all participants (100%) resided in an urban area. Moving on to parental

background, regarding fathers' occupations, (50.3%) were employed. Mothers' employment rates were lower, with (33.4%) unemployed. In terms of education, fathers were more likely to be able to read and write (30%) compared to mothers (36.7%) illiterate.

Table (2): shows that (50.5%) reported using their devices for 5-8 hours daily, with most using them at any time (63%). (47.4%) use their devices frequently (more than three times daily). Social media emerged as the primary application, (66.6%) of students using it primarily for chatting on platforms like Facebook, Twitter, and WhatsApp. Interestingly, playing games was the most common reason for device usage, reported by 56% of students. (73.5%) of students displayed high proficiency in using all applications without assistance. Notably, 75.1% of students specifically reported using smartphones or tablets.

Table (3): shows that (47%) reported sleeping more than 7 hours per night. However, (60%) experienced sleep disturbances at least once or twice a week. This disjointed sleep was further reflected (45%) of participants indicating somewhat daily dysfunction, suggesting a potential negative impact on their daily lives.

Figure (1): illustrates that (85%) of participants reported unsatisfactory sleep quality, with (15%) experiencing satisfactory sleep.

Figure (2): illustrates that a significant portion (50%) exhibited high levels of multi-screen addiction, while another substantial group (45%) demonstrated moderate addiction. Notably (5%) reported low levels of multi-screen addiction.

Figure (3): demonstrates (80%) of participants exhibited low self-control level, while (13%) of them had moderate self-control level. Notably, only (7%) reported high self-control level. A significant portion of the sample lacked strong self-control abilities.

Table (4): Show that there was a highly statistically significant difference ($P < 0.001$) between studied sample multi-screen history and their multi-screen addiction, sleep quality, and their self-control level.

Table (5): Illustrated that there was a highly statistically significant correlation between multi-screen addiction and studied sample sleep quality and their self-control level at $p < 0.001$. There was a moderate positive

correlation between social media addiction and studied sample sleep quality and their self-control and there was a strong positive correlation between studied sample sleep quality with their self-control.

Table 1: Distribution of the demographic traits among the participants (n = 300):

Items	No.	%
Age		
12 + years	32	10.7
13 +years	85	28.3
14 +years	106	35.3
15 +years	77	25.7
sex		
Male	196	65.3
Female	104	34.7
Educational grade		
1st preparatory	42	14
2nd Preparatory	213	71
3rd Preparatory	45	15
Birth order		
First	126	42
Second	120	40
Third or more	54	18
Family type		
Nuclear family	256	85.4
Extended family	44	14.6
Residence		
Urban	100	100
parent's occupation		
Employee	151	50.3
Unemployed	6	2
Others	73	24.3
Daily work	60	20
Dead	10	3.4
Mothers' occupation		
Employee	90	30
Unemployed	100	33.4
Others	92	30.6
Daily work	18	6
Dead	0	0
Father's education		
Illiterate	85	28.3
Read & write	90	30
Primary / Preparatory	65	21.7
Secondary / University	60	20
Mother's education		
Illiterate	110	36.7
Read & write	80	26.7
Primary /preparatory	60	20
Secondary /university	50	16.6

Table (2): Percentage distribution of student's general information related to multi-Screen history (n = 300):

Items	No	%
The duration time of electronic devices usage daily		
2-5 hours	34	11.3
> 5-8 hours	150	50
> 8 hours	116	38.7
Time of using the electronic devices		
When wake up	18	6
After school time	15	5
Before sleeping	78	26
At any time	189	63
Frequency of electronic devices use daily		
Once	25	8.3
Twice	28	9.3
More than three times	142	47.4
Many times	105	35
What is the essential app used		
Web	60	20
Social media (face book- twitter-whatsApp)	200	66.6
Videos (you tube)	40	13.4
The reason of electronic devices usage		
Playing	168	56
Listening music	35	11.7
Share files	13	4.3
Chatting (Voice call)	84	28
Ability to use all options of electronic devices without help		
Poor	15	5
Moderate	60	20
Excellent	225	75
The electronic devices are usually used		
Laptop	19	6.3
Smart phone / Tab	255	85
Computer	26	8.7

Table 3: Percentage distribution of sleep quality among participants (n = 300):

Item	No.	%
Subjective sleep quality		
Very good	150	50
Fairly good	48	16
Fairly bad	39	13
Very bad	63	21
Sleep latency		
No	180	60
< 1 on a week	60	20
1-2 on a week	33	11
>3 times a week	27	9
Sleep duration		
>7 hours	141	47
6- 7 hour	48	16
5- 6 hour	75	25
<5 hour	36	12
Habitual sleep efficiency		
>85.0%	147	49
75- 84%	63	21
65- 74%	33	11
< 65.0%	57	19
Sleep disturbances		
No	6	2
< 1 on a week	57	19
1-2 on a week	180	60
>3 times a week	57	19
Use of sleeping medication		
Not during the past month	99	33
< 1 on a week	54	18
1-2 on a week	78	26
>3 times a week	69	23
Daytime dysfunction		
No	36	12
Slight dysfunction	60	20
Somewhat dysfunction	135	45
Big problem	69	23

Figure 1: Distribution of the sleep quality levels among participants (n=300):

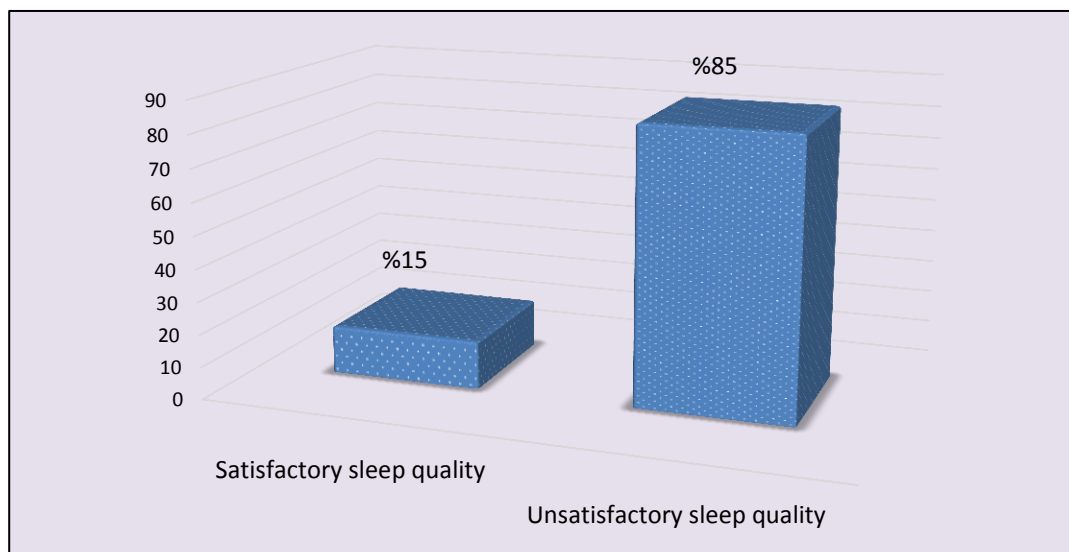


Figure 2: Percentage distribution of the students related to multi-screen addiction among the participants (n = 300):

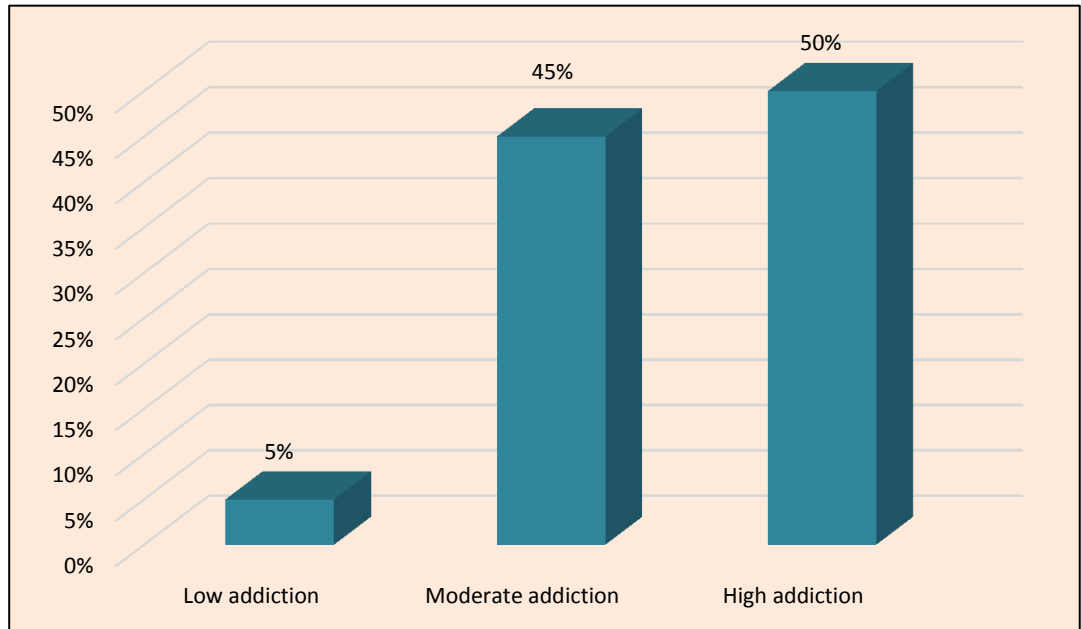


Figure 3: Distribution of self-control level among the participants (n = 300)

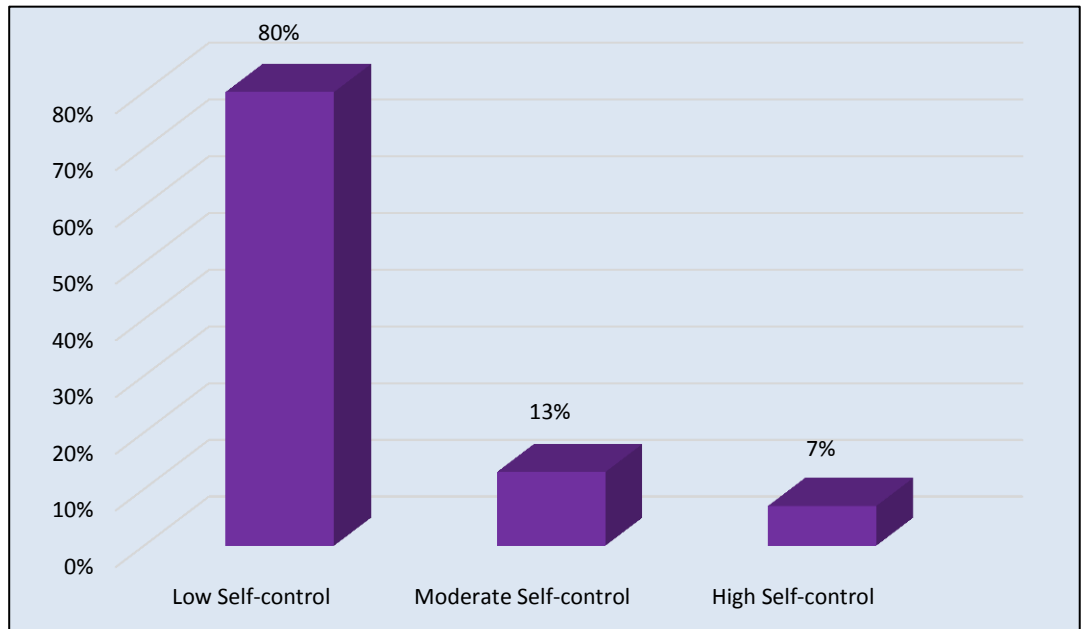


Table 4: Relation between studied sample multi-screen addiction history and their multi-screen addiction, sleep quality and life satisfaction (n = 300):

Items	No.	Multi-screen addiction						Sleep quality				Self-control					
		low (n = 15)		Moderate (n = 135)		High (n = 150)		Satisfactory (n = 45)		Unsatisfactory (n = 255)		Low (n = 240)		moderate (n = 39)		High (n = 21)	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
The duration time of electronic devices usage daily																	
2-5 h	34	8	23.5	12	35.3	14	41.2	30	88.2	4	11.8	9	26.5	11	32.3	14	41.2
> 5-8 h	150	4	2.6	111	74.1	35	23.3	12	7.9	138	92.1	129	86.1	16	10.7	5	3.2
> 8 h	116	3	2.6	12	10.3	101	87.1	3	3.5	113	96.5	102	87.9	12	10.3	2	1.8
X ² (P- Value)	87.411 (0.0001) **						23.996 (0.0001) **				18.67(0.004) **						
Time of using the electronic devices																	
When wake up	18	2	11.1	4	22.2	12	66.7	10	55.6	8	44.4	12	66.8	3	16.6	3	16.6
After school time	15	2	13.3	3	20	10	66.7	10	66.7	5	33.3	5	33.3	7	46.6	3	20.1
Before sleeping	78	3	3.8	32	41.1	43	55.1	12	15.4	66	84.6	69	88.5	5	6.4	4	5.1
At any time	189	8	4.3	96	50.8	85	44.9	13	6.9	176	93.1	154	81.4	24	12.7	11	5.9
X ² (P- Value)	5.987 (0.112)						11.898 (0.04) *				32.995 (0.0001) **						
Frequency of electronic devices use daily																	
Once	25	2	7.8	8	32.1	15	60.1	15	60.1	10	39.9	12	48.1	6	24.1	7	27.8
Twice	28	2	7.1	12	42.8	14	50.1	17	60.7	11	39.3	13	46.4	7	25.1	8	28.5
More than three times	142	5	3.6	70	49.3	67	47.1	6	4.2	136	95.8	119	83.8	19	13.4	4	2.8
Many times	105	6	5.8	45	42.8	54	51.4	4	3.8	101	96.2	96	91.4	7	6.7	2	1.9
X ² (P- Value)	35.793 (0.001) **						47.876 (0.0001) **				19.698 (0.001) **						
What is the essential app used																	
Web	60	7	11.6	20	33.3	33	55.1	15	24.9	45	75.1	31	51.7	22	36.7	7	11.6
Social media	200	3	1.4	103	51.5	94	47.1	19	9.5	181	90.5	184	92.1	7	3.4	9	4.5
Videos (you tube)	40	5	12.4	12	30.1	23	57.5	11	27.5	29	72.5	25	62.5	10	25.1	5	12.4
X ² (P- Value)	10.687 (0.021) *						2.358 (.282)				6.176 (0.04) *						
The reason of electronic devices usage																	
Playing	168	8	4.7	70	41.7	90	53.6	9	5.4	159	94.6	155	92.2	10	5.9	3	1.9
Listening music	35	2	5.8	15	42.8	18	51.4	7	19.9	28	80.1	8	22.8	19	54.4	8	22.8
Share files	13	2	15.5	5	38.4	6	46.1	10	76.9	3	23.1	3	23.1	2	15.4	8	61.5
Chatting (Voice call)	84	3	3.6	45	53.6	36	42.8	19	22.7	65	77.3	74	88.1	8	9.5	2	2.4
X ² (P- Value)	9.256 (0.01) *						.691 (0.413)				59.857 (0.0001) **						
Ability to use all options of electronic devices without help																	
Poor	15	10	66.6	3	20.1	2	13.3	10	66.7	5	33.3	5	33.3	5	33.3	5	33.4
Moderate	60	3	5.1	17	28.3	40	66.6	20	33.3	40	66.7	29	48.3	21	35.1	10	16.6
Excellent	225	2	0.8	115	51.1	108	48.1	15	51.1	110	48.9	206	91.5	13	5.7	6	2.8
X ² (P- Value)	39.995 (0.0001) **						24.996(0.0001) **				37.411(0.0001) **						
The electronic devices are usually used																	
Laptop	19	3	15.8	6	31.6	10	52.6	8	42.1	11	57.9	10	52.6	5	26.3	4	22.1
Smart phone / Tab	255	10	8.9	111	49.3	134	59.6	30	11.8	225	88.2	216	84.7	28	10.9	11	0.9
Computer	26	2	7.7	18	69.2	6	23.1	7	26.9	19	73.1	14	53.8	6	23.1	6	23.1
X ² (P- Value)	31.768 (0.0001) **						34.434 (0.0001) **				42.238 (0.0001) **						

*Statistically significant differences <.05 **, Highly statistically significant differences <.001

Table 5: Correlation matrix between social media addiction, sleep quality, and self-control among the studied sample (n = 300):

		Multi-screen addiction	Sleep quality	Self-control
Multi-screen addiction	r	1		
	P-value			
Sleep quality	r	.581	1	
	P- value	.0001**		
Self-control	r	.646	.764	1
	P-value	.0001**	.0001**	

Discussion

Though the exact definition of "multi-screen addiction" is debated, its rise, especially in preparatory school children is clear (**Yildiz Durak et al., 2023**). This trend demands investigation of its potential harms, particularly on sleep and self-control. Adequate sleep is vital for teens, impacting learning, memory, and emotional regulation (**Liu et al., 2022**). High self-control, conversely, is linked to positive life outcomes (**Lee et al., 2023**), while low self-control is associated with negative behaviors (**Öztekin, 2024**).

Due to the lack of research in Egypt that has attempted to determine the relationship between multiple screen addiction, sleep quality, and level of self-control, this study aims to examine the relationship between multi-screen addiction, sleep quality, and level of self-control.

Concerning the demographic characteristics among the studied sample, our study participants primarily consisted of 14-year-old males. The majority was in the second preparatory grade and was likely the second-born child in their families. Interestingly, all participants hailed from nuclear families living in urban environments. While paternal employment rates were around half, a significant portion of mothers were unemployed. Notably, fathers displayed higher literacy rates compared to mothers.

The present research in line with (**Fouad et al., 2019**) who found that the study revealed a notable portion of participants were teenager, with a larger group falling within the 14-year-old age range compared to 13-year-olds. The sample skewed male, most participants hailed from nuclear families living in urban environments.

Also, this result was approved by (**Mohamed et al., 2023**) who study revealed that a notable portion of participants' parents were employed, with a clear distinction between fathers and mothers. Fathers were more likely to be employed, while a significant portion of mothers appeared to be homemakers.

Regarding multi-screen history, the present study found a significant portion of participants using their devices for several hours daily, with

most being flexible about usage times. Nearly half used their devices frequently throughout the day. Social media was a dominant application, primarily used for communication. Interestingly, games were the most popular activity on these devices. Notably, a large majority of participants displayed high proficiency in using all applications independently. Smartphones or tablets were the primary devices used by a significant portion of the study.

Study findings is in line with (**Naguib et al., 2023**) and (**Fouad et al., 2019**) who revealed a significant portion of participants used electronic devices for several hours daily, with some exceeding eight hours. Interestingly, a smaller portion used their devices frequently throughout the day (more than three times).

Also consistent with (**Masoed et al., 2021**) who revealed a significant portion of participants spent several hours daily using the internet. A notable portion also reported using social media for an extended period, close to five years. Interestingly, many participants maintained multiple social media accounts, nearly half having three or more. Also, the present study in accordance with (**Khazaei et al., 2024**) who reported identified two-way communication websites as a preferred platform for internet addicts. This category includes chat rooms, game websites, and email.

The current study differs from (**Scott et al., 2019**) who looked into how teenagers' use of social media affects their sleep and found that over one-third of study participants used social media for one to less than three hours each day, and (**Ikeda et al., 2024**) who demonstrate that participants' partners most frequently used Facebook for 30 minutes to an hour and for two to three hours.

The current study's findings regarding sleep quality revealed that almost half of the sample slept for more than seven hours, and that over half of them experienced sleep disturbances once or twice a week. Additionally, over a third of the sample reported some level of dysfunction on a daily basis, which may have a negative effect on their day-to-day activities. Similarly (**Karki et al., 2021**) who found a significant number of participants reported sleeping well (around 7 or 8 hours on average).

Moreover, this study is in accordance with **(Lin et al., 2024)** who suggested a potential link between multi-screen media usage patterns and sleep experiences among students. Students who reported higher multi-screen media use might describe experiencing more disrupted sleep or difficulty falling asleep compared to those with lower usage. Further investigation is needed to understand the specific ways multi-screen media might influence sleep quality and the impact on students' daily lives.

Consequently, a supported study done by **(Bezerra et al., 2023)** who suggested that poor sleep quality could be a critical intermediary factor in the relation between accessed social media utilization and the increase of anxiety or depression among participants. Experience researchers might explore how accessed social media utilization disrupts sleep patterns, leading to feelings of fatigue, difficulty concentrating, and increased emotional vulnerability. These experiences of disrupted sleep could then contribute to the development of anxiety or depression symptoms.

Concerning sleep quality level, this study indicated that the highest number of participants reported unsatisfactory sleep quality, with only a minority experiencing satisfactory sleep, this disruption could manifest in various ways, like difficulty falling asleep due to mental stimulation from multi-screen using and availability of online contact, fragmented sleep due to notifications or late-night browsing, or waking up feeling unrested because of multi-screen time close to bedtime. Investigating participants' experiences with multi-screen use patterns before bed, their sleep environments, and their subjective feelings around sleep could provide valuable insights into the specific ways internet addiction disrupts sleep quality and its effect on their daily lives.

Likewise, **(Huang et al., 2023)** who revealed a concerning prevalence of sleep difficulties among participants. A significant majority reported experiencing unsatisfactory sleep quality. The same result found in the study done by **(Maciel et al., 2023)** who found that a large portion of the sample reported experiencing unsatisfactory sleep. Also, **(Monteiro et al., 2023)** who suggested a potential cause-and-effect relationship between

internet addiction and sleep quality. While occasional internet use might cause drowsiness, and recommended more researches particularly interested in how repetitive and compulsive internet use patterns disrupt sleep over time.

Concerning multi-screen addiction, this study showed that a significant portion exhibited high levels of multi-screen addiction, while another substantial group demonstrated moderate addiction. Notably, only a small minority reported low levels of multi-screen addiction. This result was confirmed by **(Shoshani et al., 2024)** who reported a prevalence of potentially problematic daily screen time among the participants. While their result mention a "heavy addiction" in the majority of the sample, needing more researches to investigate the impacts of this problem.

Moreover, this study is in accordance with **(Hammad et al., 2024)** who found near to third of sample exhibited severe internet addiction, followed by nearly more than a third with moderate internet addiction, and about one fifth showed no signs of internet addiction.

Concerning self-control level, this study illustrated that the majority of participants exhibited low self-control level, while more than one fifth of them had moderate self-control level. Notably, only a small minority reported high self-control level. A significant portion of the sample lacked strong self-control abilities.

This result comes in line with **(Gökalp et al., 2023)** who found that a core feature of multi-screen addiction is the loss of control over impulses, higher multi-screen addition lead to negative self-control. Also, highlight the difficulty resisting urges in those who procrastinate. Consequently, a supported study done by **(Kaya, 2024)** who reported a potential pathway through which smartphone addiction might negatively impact adolescents' overall well-being and self-control. The findings highlight a link between smartphone overuse, academic procrastination, and feelings of school burnout. Moreover, this study is in accordance with **(Şimşir Gökalp, 2023)** who showed that multi-screen addiction lead to a low level of self-control.

Concerning the relation between multi-screen history of studied sample and their multi-screen addiction, sleep quality, and their self-control level, this study found that there was a highly statistically significant difference ($P < 0.001$) between studied sample multi-screen history and their multi-screen addiction, sleep quality, and their self-control level. The same result found in the study done by (Figueroa-Quiñones et al., 2024) who shown a link between excessive Facebook use and difficulty sleeping. This is concerning because the research also found that more than fifty percent of the students surveyed reported poor sleep quality. Consequently, a supported study done by (Gökalp et al., 2023) who noted significant relation between multi-screen addiction, self-control level and procrastination.

Moreover, this study is in accordance with (Burnell et al., 2023) who reported that teenagers who struggle with self-control are more likely to develop problematic habits with digital technology. This is especially true during adolescence, a time when these technologies are highly appealing. To address this concern, interventions and preventative measures should target teenagers with lower self-control. Likewise, (Niu et al., 2020) their research highlights the importance of self-control and healthy parent-child relationships in preventing problematic phone use in teens and they reported that teens with lower self-control were more at risk of problems with phone use if their parents frequently ignored them for their phones.

This study discovered a highly statistically significant correlation ($p < 0.001$) between multi-screen addiction and the studied sample's self-control level and sleep quality, as indicated by the correlation matrix between multi-screen addiction, self-control, and self-quality.

This finding is in accordance with (Junior et al., 2024) who found positive correlation between internet addiction and sleep quality. The same result found in the study done by (Li et al., 2021) who suggested people with stronger self-control are less likely to be addicted to the internet, and there was positive correlation between internet using and poor self-control. Likewise, (Bai et al., 2024) who

found a clear correlation between internet addiction and poor sleep quality. People who showed signs of internet addiction were more likely to have trouble sleeping. Consequently, a supported study done by (Zhang et al., 2024) who showed that there was correlation between self-control and unhealthy mobile addiction. Also, teenagers with weaker self-control were more prone to developing an unhealthy addiction to mobile phones. This suggests that helping teens improve their self-control and consider the long-term consequences of their actions (time perspective) could be beneficial. By doing this, we could improve their overall well-being and reduce their dependence on phones.

Conclusion

The present research focused that multi-screen addiction increased among preparatory school' students and its impact reversely on their sleep quality as well as self-control. The majority of the studied sample who uses the internet more than 8 hours daily had highly multi-screen using addiction, more than half of them who using multi-screen at any time and essential application for them was social media had highly multi-screen using addiction with highly statistically significant differences. Concerning studied sample sleep quality, the majority of studied sample who using multi-screen more than eight hours, at any time, frequently chatting, and excellence in dialing with multi-screen had unsatisfactory sleep quality with highly statistically significant differences. Regarding self-control among the studied sample, the majority of studied sample who using multi-screen more than eight hours, at any time, frequently chatting, and excellence in dialing with multi-screen had low self-control with highly statistically significant differences.

Recommendations

Recommendations for Educational Programs:

Interactive Workshops: Engaging workshops educate students on multi-screen addiction, its effects on sleep and self-control, and provide tools for self-assessment and healthy screen time management.

Digital Wellness Curriculum: Integrate a program into the existing curriculum that teaches responsible technology use, time management, sleep hygiene, and self-regulation in a way that's relevant to their age.

Parental Involvement Sessions: Educate parents on recognizing multi-screen addiction in teens, its consequences, and strategies to promote healthy digital habits within the family, fostering open communication about screen time.

Recommendations for Further Research:

Parental Controls: investigate the effectiveness of different parental control methods and how they impact student behavior, parental preferences, and parent-child relationships.

Peer Support Networks: explore how social circles and friendships influence digital habits. It would look for ways to leverage peer support to encourage healthy screen time.

Limitations of the study

This study's focus on school students presents a limitation in how broadly we can apply its findings. Generalizability refers to the ability to confidently say the results would hold for other populations. In this case, because we only studied school students, we can't be certain if the connections between multi-screen addiction, sleep quality, and self-control would be the same for other age groups or educational settings.

To gain a more well-rounded understanding of these relationships, it would be beneficial to replicate this study with different student populations. This could involve recruiting participants from universities, vocational schools, or even younger age groups like middle school. By including a wider range of students, we could see if the patterns observed in this study hold true across different educational contexts and developmental stages.

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