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# Mitigating the Risks of Digital Addiction among Secondary School Students: A Cognitive-Behavioral intervention

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## Abstract

Although problematic internet use has increased, adolescents' media use reflects a normative demand for information, communication, recreation, and functionality. It seems timely to include preventative efforts given the arguably worrying prevalence rates worldwide and the growing problematic use of social media and gaming. This study aimed to mitigate the risk of digital addiction among secondary school students: cognitive-behavioral intervention. A quiz-experimental, pre-post-test group design was utilized to conduct the current study in secondary governmental schools, at Benha City during the period from beginning September 2023 to end of February 2024. **Subjects:** A sample of convenience of 420 students recruited based on the total number of students who were present in the study settings during 2023 by using software EPI /info (version 3.3). **Tools:** A self-administered questionnaire was utilized for data collection. It consisted of three parts 1) Personal characteristics 2) Pattern of internet use, and 3) Digital Addiction Scale. **Results:** Showed that there was a decline in the severity of degree of digital addiction; about 47.6% of students had a severe degree of digital addiction pre intervention, and 38.3% of them had a severe degree after the intervention, and that there was a highly significant statistical difference among pre-post-test of in the total addiction score among students. **Conclusion:** Cognitive-Behavioral intervention was effective in changing addiction criteria and reducing the degree of digital addiction among students. **Recommendation:** Increasing awareness about digital addiction and importance of adopting healthy ways in order to mitigating the risks of digital addiction through Cognitive-Behavioral intervention to more secondary students were needed.

**Keywords:** A Cognitive-Behavioral intervention, Digital addiction, Risks.

## Introduction:

A subtle shift is occurring in the civilization and the nation is becoming a "dot com" nation. Social transformation is taking place. The internet is the most powerful technological advancement of the 20th century, enabling all of these things in every way. Currently, the internet is one of the key technological systems that is changing how people define knowledge, value, and social interactions. It has evolved into a hub for everyone's entertainment, interaction, and communication **(Madhuri & Vedpal, 2018).**

Because cellphones are so widely available, people use them for everything. This has piqued experts' interest. Tests have been carried out recently in an effort to look at a number of problems, including TV addiction, excessive computer game use **(Geisel et al., 2021)**, online gambling disorders **(Darvesh et al., 2020),** and, in general, internet addiction **(Kuss & Pontes, 2018)**. Nomophobia, the term for the excessive usage of cellphones, has emerged as a major global social issue and has been shown to be a type of technological addiction **(Fabio et al., 2022).**

Addiction is currently understood to be a pleasurable activity that, when exposed repeatedly, progressively results in loss of control and other unfavorable outcomes **(Eide et al., 2018).** There is no official diagnosis for media and digital addictions, although some psychologists believe they are similar to drug addictions. A digital addict is someone who finds it difficult to give up using technology even though it has a detrimental impact on their life **(The United Brain Association, 2024). Kushlev & Dunn (2019)** argues that the brain gets a "thrill" from internet pornography addiction, for instance, and both conditions involve conditioning mechanisms that encourage continuing the rewarding behavior despite negative effects.

Teenagers today are thought to interact with digital media for approximately eight and a half hours every day on average, not counting the time they use it for academic purposes **(Rideout et al., 2022)**. As early as

2013, 70% of teenagers between the ages of 14 and 18 were using social media on a daily basis. By 2018, this number had even increased to 45% of teenagers using the internet "almost all the time" and declaring that messaging applications are the most popular and practical way for them to communicate with their pals **(Boniel-Nissim, 2018).**

But increased usage of the Internet eventually leads to psychological problems associated with overuse. A number of teenagers, for instance, claim to be emotionally dependent on the Internet and to become resentful and angry when they are forced to disconnect **(Wolanski, 2020)**. Use of social media can lower subjective well-being, according to recent experimental research **(Allcott et al., 2020).** Overuse of the internet can lead to a variety of problems, including health problems, psychological distress, broken relationships, and subpar work or academic results. But the issue of Internet addiction is becoming worse **(Pinkston, 2022).**

Digital Addiction (DA) is a sophisticated, progressive habit that is developed as a result of both poor conduct and cognition working together. Modifying one's cognitive style, breaking bad habits, and maintaining one's post-rehabilitation condition are all necessary for changing this behavior. Reorganizing one's lifestyle, developing new skills, and cognitive reconstruction are the three primary strategies in the prevention and treatment of Internet addiction (IA) **( Zhang et al., 2019).**

The most trans-diagnostic psychotherapy approach with the greatest amount of empirical support is cognitive behavioral therapy (CBT) **(Dobson et al., 2019).** According to **Mcleod (2023),** the foundation of CBT is the idea that emotions, ideas, and actions are interconnected and the suggestion that altering one's thought process can have an impact on behavioral modifications.

The main evidence-based cognitive behavioral therapy methods to cut back on adolescent internet addiction are; gaining awareness of oneself, other people, and the surroundings; understanding the advantages and hazards of using the Internet; Understanding and identifying the factors that lead to compulsive Internet use (such as disconnecting from particular apps, experiencing difficult emotions, the impact of the surroundings, and important life events); acquiring emotional maturity and impulse control in relation to Internet access (e.g., relaxing muscles and breathing exercises); acquiring and managing time management strategies; enhancing interpersonal and social communication skills; and dedicating time to other interests, like art **(Young, 2017).**

Programs that employ Cognitive Behavior Therapy (CBT) to treat adolescent internet addiction are thought to be beneficial in improving adolescents' self-perception and reducing symptoms of both addiction and overindulgence in internet usage overall, especially in the short term **(Agbaria, 2022).** Moreover, a study conducted in Germany with 54 adolescents aged between 9–19-year-olds (16.7% of whom were Internet addicts), found a significant reduction in internet usage times as well as the psychological and physical effects of use after a brief cognitive behavioral therapy program. Following the program's four weekly sessions, the improvement started and persisted for the following 12 months **(Szasz-Janocha et al., 2021).**

## Significant of study:

Adolescents are particularly vulnerable to internet overuse and its negative effects. A study indicates that 34.8 percent of the high school kids under study had mild Internet addictions, 21% had moderate addictions, and 4% had severe addictions **(Abd El-Mawgood, et al., 2021).** Recent research in Egypt conducted by **Khalil et al., (2022)** showed that 92.8% of participants were addicted to Facebook, 61.3% were addicted to gaming, and over 75% were addicted to the internet. Addicted teenagers also frequently have depression, dysthymia, suicide, social anxiety, panic attacks, and phobias. Due to the expanding availability and influence of social media, mobile devices, and computers in daily life, problematic internet of this group may pose a heightened risk to internet addiction and a chance to apply the CBT principles.

The nomenclature, severity scale, and diagnostics for internet addiction are still not universally agreed upon. Also, despite the fact that CBT is thought to be the most appropriate for treating the issue, it is still challenging to pinpoint its exact characteristics and advantages **(Yukan et al., 2018).** The empirical construct of internet addiction is still in its early stages, so there is a lack of knowledge regarding the enduring consequences of cognitive behavioral therapy (CBT) on reducing Internet addiction in adolescents, especially when it comes to cross-cultural effects **(Zajac et al., 2017).** Therefore, this study is a particularly significant and understudied population that could benefit greatly from this CBT intervention for internet addiction.

**Operational definition:**

In medical jargon, pathological internet disorder (PIU) or internet addiction (IA) are synonyms for **digital addiction (DA) (Tong et al., 2019)**. Internet addiction disorder defined as an excessive use of internet.

**Aim of the study:**

This research sought to mitigate the risk of digital addiction among secondary school students. This was

accomplished through out screening a sample of high school students, creating and putting into practice a cognitive-behavioral intervention specifically for adolescents with DA, and assessing the program's impact on DA symptoms.

**Research hypotheses:**

**H1.** There is a number of School students have digital addiction.

**H2.** Students with digital addiction who receive the cognitive-behavioral intervention show a reduction in their internet addiction compared to pre-program.

**H3.** School students with digital addiction who receive the program show improvements in six-core addiction criteria than pre-program.

## Subject and Methods

**Study design:**

A quiz-experimental research design was used, this study employed a pre-post-test group design.

**Setting**

A sample from Benha City's basic secondary governmental schools was included in the study (totaling eight schools). The three secondary schools were randomly selected and represented the various geographic districts of Benha City, namely Om Al Moamenin High School, Mansheya High School for boys, and Al-Shaimaa Girls School.

**Participants**

In this investigation, a convenience sampling was employed. EPI /info (version 3.3) program was used to calculate the total number of student attendance in 2023, with a 95% confidence interval (CI). 1635 secondary governmental school students of both sexes participated in the study. These students are put to DA screening. 420 students with verified DA were enrolled in the remediation program using the Digital Addiction Scale **(Hawi et al., 2019)**.

**Inclusion criteria:**

- Aged 16–18 years and has court judgment.
- Both sex students who use electronic devices and have access to the internet at home.

**Exclusion criteria:**

A history of severe physical or psychological problems; and a lack of participation in cognitive-behavioral sessions.

**Study tools:**

A self-administered questionnaire was developed based on existing literature and validated scales related to Pattern of internet use and digital addiction scale. The questionnaire will include three parts:

**Part one:** Personal characteristics of studied sample as age, gender, current grade, father and mother's level of education, person live with, and number of siblings.

**Part two:** Pattern of internet use contains devices currently owned, devices used for internet access, internet points of access, reasons for going online, internet social networking tools used, daily internet use, causes of problematic internet use (PIU), effects of PIU, and suggestions of ways to mitigate PIU **(Ilesanmi et al., 2021).**

**Part three: Digital Addiction Scale:** It adopted from **Hawi et al., (2019)**. The twenty-five-items self-report questionnaire was created using **Griffiths' (2005)** mapping and nine diagnostic DSM-5 IGD criteria. Preoccupation, tolerance, withdrawal, changing one's mood, conflict, and relapse are the six fundamental conditions for addiction. Three more criteria were added to those (i.e., difficulties, deception, and displacement). Some items of this scale contained more than one option and are marked by (*).

**Scoring system:** All items are rated on a five-point Likert scale: every item is assigned a number between 1 and 5, representing never, seldom, occasionally, frequently, and always. Scores range from 25 to 125, where higher numbers correspond to greater levels of digital dependency.

**Validity**

A jury of five nursing professionals reviewed the tool to ascertain its content's validity. The instrument's content coverage, clarity, wording, length, format, and general appearance were to be examined by every expert panel. The Digital Addiction Scale had a validity rate of 97%.

**Reliability**

In order to verify the consistency of the tool, reliability testing was done on the study instruments. The self-administered questionnaire and The Digital Addiction Scale were compared for internal consistency using the Cronbach's alpha test, and the results showed that the scales' internal consistency was 0.89 and 0.87, respectively, indicating how much they measured the same idea.

**Pilot study**

Before beginning data collection, a pilot study involving 164 students (10% of the total sample) was conducted to determine the relevance, clarity, and applicability of the tools, estimate the amount of time needed to complete the questionnaire, determine the tool's relevance, identify any issues that might have interfered with the process of gathering data, and develop the final form. They were part of the sample under investigation.

**The cognitive behavioral program's development:**

The cognitive behavioral program was created by researchers. Before being put into practice, it was subsequently examined by a group of experts. The program's primary goal was to enhance schoolchildren with digital addiction's six basic addiction criteria and lessen and alter their behavioral

manifestations.

**Content of the program:**

The program had twelve Arabic language classes that were held in the school's activity area. Behavioral treatment (positive reinforcement) and educational therapy were the techniques used in the program. Students participated in the program for six weeks, meeting twice a week for one session each time.

**Data collection procedure:**

After outlining the goal of the study, administrative clearance was secured from the relevant authorities (inside the Ministry of Education). The program's goals and application strategies were discussed in meetings with secondary school administrators in an effort to win their cooperation and grant students access to the program during reduced work hours.

**Field work:**

- September 2023 to February 2024, or six months, was elapsed during the data collection period. The pre-test was administered prior to the start of the program intervention, and the post-test was conducted following the final session. The research proceeded through three phases: preliminary analysis, execution, and post-examination

**Preliminary stage:**

- The 1635 recruited students were screened through the Digital Addiction Scale diagnostic criteria for DA. There were 710 both students didn't have self-phone, 870 of them didn't have internet continuously in home, 220 didn't complete answer regarding questionnaire, and 150 refuse to participate. There were 1635 students suspected of having DA in all. In just 420 of them, the diagnosis was verified, and the intervention program was carried out **(Figure 1)**.

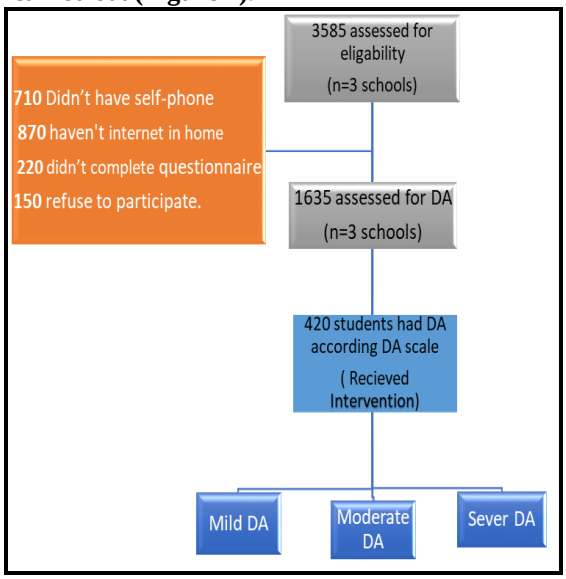


**Figure (1):** Flow of Participants for Incidence Analysis

**Execution stage:**

- In the form of scheduled sessions, the program was administered to 420 DA students. A twice-weekly schedule of 45–60 minutes in the same space (the activity room) at the same time per session served as the foundation for program creation. Every session concluded with five to ten minutes to go over the material and solicit student input. Every session has a title and goals based on the subject matter. Two small groups of thirteen or fifteen students each comprised the kids with DA. To ensure that students understood, the teaching tactics of providing feedback and reinforcement were appropriate for their requirements. During program implementation, students who showed interest were motivated by using reinforcement tactics, such as providing them with praise and/or acknowledgment.
- A summary of all methods used was given in the final session, and the program was ended utilizing study tools to gather information for the post-program assessment. A description of the students' cognitive-behavioral therapies was reviewed at the end. The researchers responded to any queries they had regarding them. Secondary students with DA received recognition for their involvement in the program.

**Evaluation stage:**

Following the conclusion of the last session, the students were assessed using the Digital Addiction Scale's six fundamental addiction criteria. The outcomes were contrasted with those of the pretest.

**Ethical considerations**

The Institutional Ethics Review Board's scientific research ethics committee, as well as the relevant school management authorities, officially approved the request. Through a signed informed consent form located on the first page of the study questionnaire, participants voluntarily provided their consent. The participants were informed that they would not be penalized if they decided to leave the study at any point. To protect data privacy and confidentiality, anonymity was employed. The code numbers were created and kept up to date by the researchers.

**Data management and statistical analysis**

An examination of statistics Data analysis was performed using SPSS version 28. On each measure for the pre- and post-tests, descriptive statistics such as means, frequency, range, and standard deviations were calculated for each group. To find the difference between variables in two categories, a Paired T-test was employed. To evaluate the connection between continuous variables, Pearson correlation (r) was used. (<0.05) was the threshold for significance.

**Results:**

**Table (1): Personal characteristics of studied students with digital addiction (DA) (n= 420)**

| Variable | Frequency | % |
|---|---|---|
| **Age in years** | | |
| 5<17 | 196 | 46.6 |
| 7-18 | 224 | 53.4 |
| Mean ±SD | **16 ± 0.934** | |
| **Gender** | | |
| Male | 150 | 35.7 |
| Female | 270 | 64.3 |
| **Current grade** | | |
| 1st | 244 | 58.1 |
| 2nd | 88 | 21.0 |
| 3rd | 88 | 21.0 |
| **Father's education level** | | |
| Basic education | 23 | 5.5 |
| Secondary education | 173 | 41.2 |
| University education and above | 224 | 53.3 |
| **Mother's education level** | | |
| Basic education | 23 | 5.5 |
| Secondary education | 126 | 30.0 |
| University education and above | 271 | 64.5 |
| **Number of siblings** | | |
| 3 | 308 | 73.3 |
| 4 | 112 | 26.7 |

**Table (2): Pattern of internet use among studied students (n=420)**

| Item | Frequency | % |
|---|---|---|
| **Devices currently owned** | | |
| Smartphone | 160 | 38.1 |
| Gaming device | 140 | 33.3 |
| Laptop | 41 | 9.8 |
| Desktop computer | 79 | 18.8 |
| **Devices used for Internet access** | | |
| Smartphone | 160 | 38.1 |
| Gaming device | 100 | 23.8 |
| Laptop | 100 | 23.8 |
| Desktop computer | 60 | 14.3 |
| **Internet points of access** | | |
| Personal smartphone /Home Wi-Fi | 370 | 88.1 |
| Paid hotspots School | 50 | 11.9 |
| Free public hotspots | 0 | 0.0 |
| **Reasons for going online** | | |
| Socializing | 140 | 33.4 |
| Communication | 90 | 21.4 |
| School assignment | 100 | 23.8 |
| Information research | 90 | 21.4 |
| **Daily internet use** | | |
| Yes | 420 | 100.0 |
| No | 0 | 0.0 |

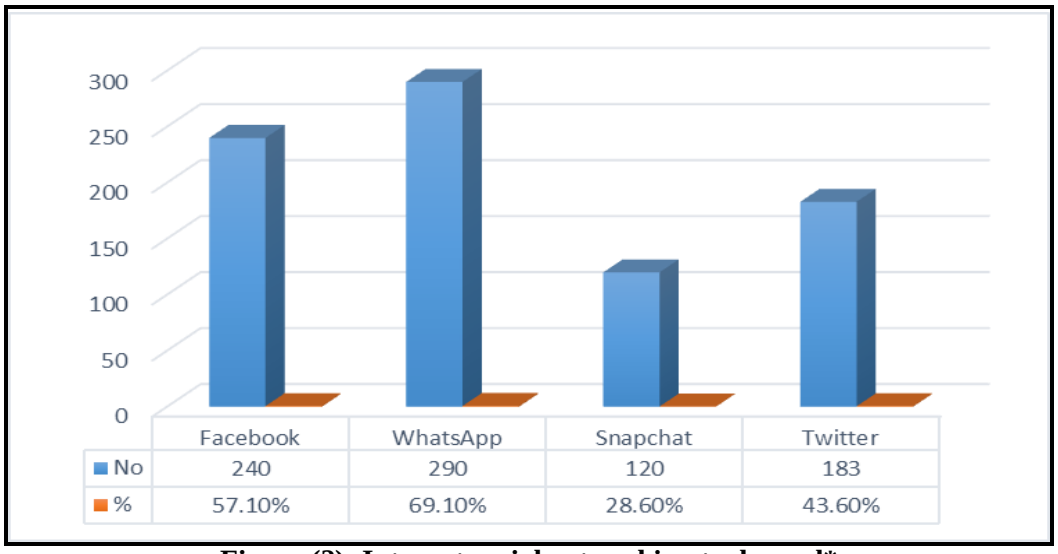


**Figure (2): Internet social networking tools used***

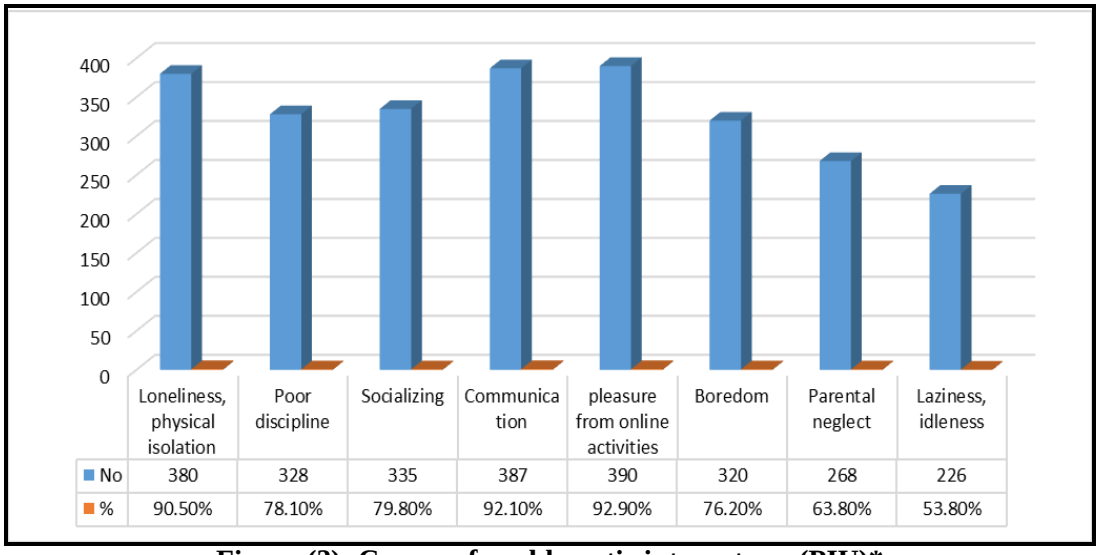


**Figure (3): Causes of problematic internet use (PIU)***

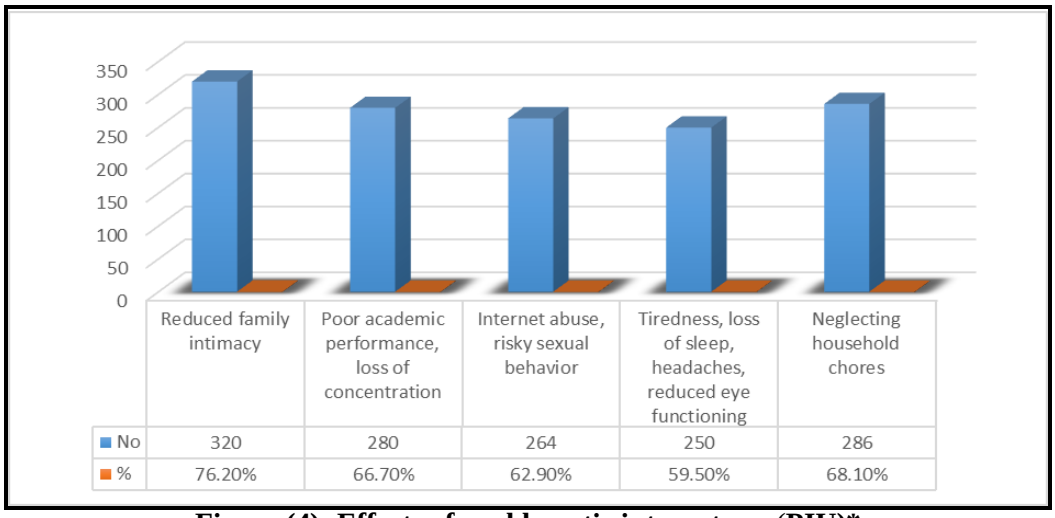


**Figure (4): Effects of problematic internet use (PIU)***

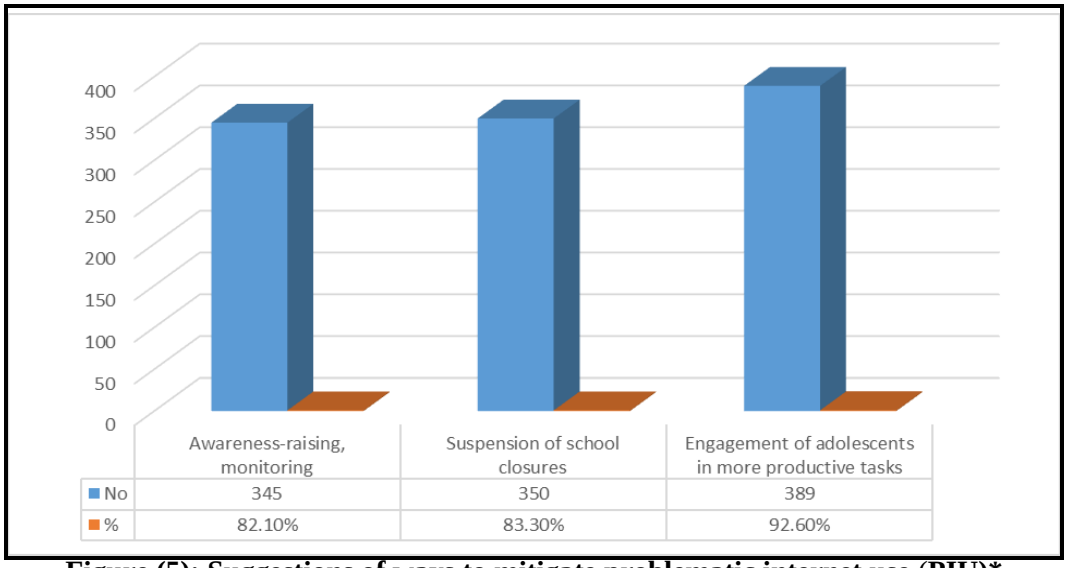


**Figure (5): Suggestions of ways to mitigate problematic internet use (PIU)***

**Table (3): Relation between level of digital addiction (DA) among studied students and their personal characteristics (n= 420)**

| Variable | Addiction score | | | | | | Chi square | P value |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | | |
| | No | % | No | % | No | % | | |
| **Age in years** | | | | | | | | |
| 15< 17 | 41 | 63.1% | 60 | 38.7% | 95 | 47.5% | **11.03** | **<0.05*** |
| 17-18 | 24 | 36.9% | 95 | 61.3% | 105 | 52.5% | | |
| **Gender** | | | | | | | | |
| Male | 31 | 47.7% | 33 | 21.3% | 86 | 43.0% | **22.73** | **<0.001**** |
| Female | 34 | 52.3% | 122 | 78.7% | 114 | 57.0% | | |
| **Current grade** | | | | | | | | |
| 1st | 40 | 61.5% | 101 | 65.2% | 103 | 51.5% | **40.43** | **<0.001**** |
| 2nd | 0 | 0.0% | 40 | 25.8% | 48 | 24.0% | | |
| 3rd | 25 | 38.5% | 14 | 9.0% | 49 | 24.5% | | |
| **Father's education level** | | | | | | | | |
| -Basic education | 0 | 0.0% | 10 | 6.5% | 13 | 6.5% | **48.14** | **<0.001**** |
| -Secondary education | 17 | 26.2% | 42 | 27.1% | 114 | 57.0% | | |
| -University education and above | 48 | 73.8% | 103 | 66.5% | 73 | 36.5% | | |
| **Mother's education level** | | | | | | | | |
| -Basic education | 0 | 0.0% | 0 | 0.0% | 23 | 11.5% | **61.76** | **<0.001**** |
| -Secondary education | 9 | 13.8% | 34 | 21.9% | 83 | 41.5% | | |
| -University education and above | 56 | 86.2% | 121 | 78.1% | 94 | 47.0% | | |
| **Number of siblings** | | | | | | | | |
| ≤ 3 | 42 | 64.6% | 112 | 72.3% | 154 | 77.0% | **3.99** | **>0.05** |
| ≥ 4 | 23 | 35.4% | 43 | 27.7% | 46 | 23.0% | | |

**Table (4): Total mean scores of digital addiction Scale (nine diagnostic DSM-5 IGD criteria) among studied students pre-and post- cognitive-behavioral intervention. (n=420)**

| Item | Pre- program | Post-program | Paired t-test | P value |
|---|---|---|---|---|
| | Mean ±SD | Mean ±SD | | |
| Preoccupation | 9.6±2.858 | 6.1±1.433 | 20.773 | <0.001** |
| Tolerance | 6.5±2.276 | 4.0±1.286 | 18.689 | <0.001** |
| Withdrawal | 12.2±5.291 | 7.2±2.783 | 16.847 | <0.001** |
| Problems | 10.9±4.078 | 7.3±1.792 | 18.453 | <0.001** |
| Conflict | 5.6±2.640 | 3.5±1.155 | 15.760 | <0.001** |
| Deception | 4.4±2.378 | 3.3±1.381 | 9.919 | <0.001** |
| Displacement | 9.0±2.854 | 5.9±1.532 | 19.399 | <0.001** |
| Relapse | 6.0±2.303 | 3.8±1.186 | 33.533 | <0.001** |
| Mood modification | 10.0±3.178 | 6.1±1.932 | 19.197 | <0.001** |
| Total addiction score | 74.3±23.152 | 47.3±9.440 | 21.65 | <0.001** |

*P < 0.001** highly statistically significant differences*

**Table (5): Comparison between the degree of digital addiction among studied students pre- and post-cognitive-behavioral intervention (n=420).**

| Scoring | Pre-program | | Post-program | | Chi-square | P value |
|---|---|---|---|---|---|---|
| | No | % | No | % | | |
| Mild addiction | 65 | 15.5 | 0 | 0.0 | 68.75 | <0.001** |
| Moderate addiction | 155 | 36.9 | 259 | 61.7 | | |
| Severe addiction | 200 | 47.6 | 161 | 38.3 | | |

*P < 0.001** highly statistically significant differences*

**Table (1):** Shows that more than half of the studied students (53.4%) aged between 17-18 years old, with mean age of 16 ± 0.934 years and nearly two thirds of them (64.3%) were female. Regarding the parent's education level, about 53.3% of the studied students reported that their father earned university education and above and nearly two thirds (64.5 %) of them their mothers had a university degree or above. Furthermore, almost three-quarters (73.3%) of the students in the study had three or more siblings.

Pattern of internet use among studied students was illustrated in **table (2):** It was found that more than one third (38.1%) of the studied students owned smartphone and used it for internet access. Moreover, the vast majority of the students under study (88.1%) utilized their personal smartphones or computers to access the internet, and about 33.14 percent of them reported that they used the internet for socializing. All of the studied students (100%) used the internet daily.

**Figure (2):** Points that the most utilized applications among students were WhatsApp and Facebook (69.1% & 57.1%, respectively).While, more than one quarter (28.60%) of them were used snapchat app.

**This figure (3):** Shows that the causes of the problematic internet use for majority of the studied students are loneliness, physical isolation communication and pleasure from online activities.

**Figure (4):** Illustrates that the majority of students with problematic internet use (76.2%) had reduce family intimacy and about two thirds (66.7%) of them had have poor academic performance/loss of concentration from the internet use. While more than half (59.5 % and 58.1%) of them had tiredness and loss of sleep and neglect household chores, respectively.

**This figure (5):** Shows that the majority of the studied students engaging in more protective tasks to mitigate problematic internet use (92.6%).

**Table (3):** Demonstrates the relationship between the studied students' personal traits and their level of digital addiction (DA). The degree of digital addiction and the majority of students' personal traits were found to be statistically significantly correlated. The Digital Addiction Scale results showed that students between the ages of 15 < 17 had low levels of DA (63.1%), while students aged between 17 and 18 had greater statistically significant percentages of high DA levels (52.3%, P<0.05). Morever, a gender bias was evident, with a greater percentage of females (57.0 %, P<0.001) at the high level of DA. The same table shows that, in terms of academic grade, first-graders had a higher DA level than students in the second and third grades (P<0.001). Furthermore, there are statistically significant relationships (P<0.001) between the students' DA level and the educational level of their parents. This demonstrated that students with parents who had university education and above had lower levels of DA than students with parents who had not. It is evident that a high education level has a detrimental effect on the students DA level.

**Table (4):** Shows the total addiction score of the students varied in a highly significant statistical way between the pre- and post-test. The six fundamental characteristics of addiction—preoccupation, tolerance, withdrawal, conflict, relapse, and mood modification-also differed statistically significantly (p<0.001). These indicate that the cognitive behavioral intervention has a beneficial effect on altering students' criteria for addiction.

**Table (5):** Indicates that after the students underwent the cognitive behavioral intervention, there was a statistically significant improvement in their treatment of digital addiction (p < 0.001). The intensity of the degree of digital addiction decreased; before the program, around 47.6% of students had a severe degree, and after the program, 38.3% of them had a severe degree. These encouraging outcomes could be linked to the intervention program's efficacy.

## Discussion

This work targeted to mitigate the risk of digital addiction among secondary school students: cognitive-behavioral intervention. A total of 1635 secondary school students were screened to have DA. The current study found that more than one quarter of the total studied students met the criteria for the Digital Addiction Scale. This could be explained by the fact that the Internet has long provided a source of countless opportunities for personal fulfillment, career advancement, and value creation. In addition, **International Telecommunication Union, (2021)** stated that internet use in Africa and the Asia-Pacific region jumped by 23 percent and 24 percent,

respectively. Similarly, **Chandrima et al., (2020)** reported that in their study about 24% (among 350 high school students aged 13–17 years) had digital addiction.

The current study result was in the line with those of earlier research, which indicated that there is a prevalence of several subtypes of digital addiction ranging from 0.5% to 84%, with significant differences in digital media subtypes, diagnostic instruments, and methodological quality **(Alhassan et al., 2018; Feng et al., 2017).** Moreover, **Lindenberg et al., (2018)** corroborated this finding, who reported that the Middle East had the greatest prevalence rates of DA and Northern and Western Europe had the lowest.

According to **Taylor (2023)** in Statista site, there were 7.1 billion mobile users globally in 2021; predictions indicate that by 2022, there will likely be 7.26 billion users. Also, Smartphones were the most popular type of digital device among children **(Turner, 2022).** In this regard, the current study found that more than one third (38.1%) of the studied students owned smartphone and used it for internet access. Similar finding was reached by **Nathan et al. (2022)** who reported that 41%of studied children have access to smartphone.

As regard the access to the network, the majority of the students in the current study mentioned that they accessed the internet from personal smartphone and home Wi-Fi. This study finding was confirmed by **Anderson Jiang (2018)** study "Teens, Social Media and Technology 2018", which found that the most teenagers in middle and high school have access to a computer and network at home. Moreover, all of the studied students used the internet daily and one third of them used the internet for socializing**.** Consistent with the current study results, an Egyptian study by **Masoed et al., (2021),** showed that most of the studied adolescents spend more than one-third of their days online, that nearly one-third have used social media for five years, and that nearly half have three social media profiles.

Furthermore, the study results indicated that WhatsApp and Facebook were the most frequently used apps higher among the IA students. This comes in line with the findings of **Chandrima et al., (2020)** who discovered that the study participants used Facebook, Twitter, Instagram, Skype, and email the most frequently.

The problematic internet use (PIU) may precipitate psychiatric symptoms, disruption of relationships, and conflict, all of which may fuel PIU **(Kumar & Mondal, 2018).** The current study found that more than three quarters and nearly two thirds of the studied students reduce family intimacy and have poor academic performance from the internet use, respectively. These findings were in the line with a study found that both academic performance and interpersonal relationships were negatively impacted by excessive and unregulated Internet use **(Livingstone et al., 2017).** In addition, a recent study conducted in China on high school students' problematic internet pornography usage (PIPU) found a significant negative correlation between family functioning and PIPU **(Li et al., 2023).**

Concerning sleep quality, the present study evidence that internet addiction has a negative effect on adolescent's sleep, with over half of them were reporting tiredness and sleep loss. This finding supported by **Masoed et al., (2021),**who found that the majority of the studied adolescents' increasing daily uses of the internet had unsatisfactory sleep quality with highly statistically significant differences.

Regarding socio-demographic characteristics in the present study, it was noticed from the Digital Addiction Scale results that the students aged between 17 and 18 had greater statistically significant percentages of high DA levels ($P<0.05$). This could be explained by the customs and cultural views that, parents of teenagers in this age group may have more lax parental controls, such as limiting their children's internet usage in comparison to younger teenagers. This finding was in agreement with **Chemnad et al., (2023)** who compared the internet addiction of middle-aged adolescents to that of early-adolescents and found that middle-aged adolescents had a higher likelihood of exhibiting the internet addiction symptom.

While a previous study indicated no gender differences in the internet addiction **(Islam et al., 2020),** the present study has demonstrated statistically significant association between all levels of DA and their gender. A gender bias was evident, with a greater percentage of females at the high level of DA($P<0.001$). This finding supported by the research conducted among adolescents in Bangladesh which revealed a gender difference in the prevalence of the problematic internet use (PIU), with females were likely to report PIU compared to males **(Afrin & Hossain, 2017).**

Additionally, the results of this study showed that adolescents whose parents had university education and above had lower levels of DA than students with parents who had not. It's clear that a student's DA level negatively impacted by their parents' education level. It is also fairly expected that high level education parents afford their children parental guidance, supervision and social connections, which potentially redound to the benefit of children.

This result was consistent with **Chandrima et al., (2020)**, who claimed that a greater PIU was inversely

correlated with the parents' education level. Adolescents with parents with less education achieved noticeably higher PIU scores. This could be as a result of the lower educational attainment of the mother and father, which is linked to a dysfunctional home environment and increased adolescents' engagement in PIU as a maladaptive avoidance technique.

The results of the current study demonstrated that, following the application of cognitive-behavioral therapy, there was statistically significant remediation in the subscales of digital addiction related to conflict, dishonesty, and relapse (P<0.001). The program's components, activities, and events, which mostly concentrated on control skills and made teenagers feel efficient, may be the cause of these changes between the mean values before and after the cognitive-behavioral intervention.

The same results were found in a randomized controlled study conducted by **Noroozi et al., (2024),** which founded that after the intervention, the training had a significant impact on the mean score of self-efficacy and decisional balancing distribution count of excessive mobile phone usage, as well as the stage of change (P < 0.001). After three months of intervention between the two groups in their study, there was a noteworthy decline in mobile phone addiction in the intervention group (P < 0.001).

One of the most extensively researched variables in this study is the level of digital addiction. Prior to intervention, almost half of the students had sever level. In a similar vein, in a study conducted in Egypt by **Masoed et al., (2021)** discovered that more than half of the teenagers there suffered from serious social media addiction. Furthermore, based on the research about the "effect of social media addiction on anxiety and the risk of a social health disaster in adolescents," conducted by **Muflih & Amestiasih (2018),** who found that 84.4% of teenagers suffered from severe addiction.

In comparison to the post-cognitive behavioral intervention, this study showed that a statistically significant decline in the percentages of the students had a severe level of digital addiction post-intervention compared to pre-intervention (P= <0.001). Therefore, the improvement suggests that the cognitive-behavioral intervention for students with digital addiction was helpful in producing a notable positive impact. A similar finding was made by a study on 54 teenagers, 16.7% of whom were Internet addicts. After completing a cognitive behavioral therapy program, the teens' Internet usage durations significantly decreased, and the negative psychological and physical effects of use were also significantly reduced **(Szász-Janocha et al., 2021).** Additionally **Malak (2018) & Alavi et al. (2021),** concluded that the most successful treatment for Internet addiction is CBT-IA.

This study findings align with previous researches confirmed that more precisely, the primary line of treatment for addictions to electronic gadgets at the moment is cognitive behavioral therapy, which has received extensive research. The efficacy of this therapy can be attributed to its ability to effectively rectify automatic, non-adaptive beliefs or to lessen the psychological symptoms associated with the addicted experience **(David et al., 2018).** Furthermore, **Yang & Kim (2018)** pointed that self-efficacy and self-regulation intervention was utilized with teenagers between the ages of 13 and 15 years. When the control group and the intervention group were compared, it was found that online time and Internet addiction had dramatically decreased, but self-efficacy and self-control had greatly increased.

Lastly, this study can be serve as a basis for more comprehensive attempts in the future to document the impact of cognitive behavioral interventions on remediation in students with Digital Addiction (DA). The program's activities were also incorporated into a pertinent framework with appropriate breaks in between sessions, and the sessions were divided according to the students' cognitive capacities. However, this study has certain limitations that should be taken into account when interpreting the current study findings, just like any other research.

First of all, due to the limited sample size and single-group data collection, the prevalence of DA in teenagers could not be broadly estimated (one explanation for this restriction could be because the primary goal of the study was to alter DA manifestations rather than assess the prevalence). Secondly, the research employed an online self-report methodology that could be susceptible to biases related to memory recall and social desirability. Similarly, a control group that may have mediated the effects of the cognitive-behavioral intervention is absent from this study.

## Conclusion

The present study highlighted the digital addiction increased among adolescents' students and the Cognitive-Behavioral intervention was effective in reducing the degree of digital addiction among students. Where, following intervention, there was a statistically significant difference in six key addiction characteristics. These demonstrate how the cognitive-behavioral intervention has changed students' perceptions of addiction in a favorable way.

## Recommendations

**Based on the results of the study, the following recommendations are suggested:**

- Increasing awareness about digital addiction and importance of adopting healthy ways in order to mitigating the risks of digital addiction through a Cognitive-Behavioral intervention to all secondary students were needed.
- In order to determine whether their children may have a digital addiction, parents should look into cognitive behavioral programs as soon as possible.
- Schools should play an effective role in delivering an educational message to adolescents regarding digital addiction, particularly its harmful and beneficial impacts.
- In addition, a rigorous and long-term program focusing on cognitive behavior ought to be expanded to include younger age groups in elementary schools (or community centers).
- Regular education programs for teachers are suggested to recognize early detection of digital addiction and the appropriate uses of the internet by adolescents.

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