

The Effects of Internet Addiction on the Academic Performance of Medical Students at Omdurman Islamic University: An Online Cross-sectional Study

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Abstract

Background:

In general, the emergence of new technologies such as the internet, social networks and providing opportunities to facilitate and improve global communications quality have created some threats, as Internet Addiction Disorder (IAD), which is an emerging psychological problem across the globe. Young defined it as “an individual’s inability to control his or her use of the internet, which eventually causes psychological, social, school, and/or work difficulties in a person’s life”. Students are among the most critical internet and social networks, particularly during the coronavirus recent pandemic. The prevalence of internet addiction and its association with academic performance among Sudanese medical students has not been discussed yet. Therefore, this study aimed to assess the effects of internet addiction on medical students’ academic performance.

Methods:

This study was an observational descriptive cross-sectional study conducted on medical students at Omdurman Islamic University in Sudan from 321 sample size by stratified random technique. Data were collected using a questionnaire that contains four sections; the last one is the Internet Addiction Test (IAT), a 20-item scale that measures the presence and severity of internet addiction, developed by Young. Data were analyzed using the statistical package for social science (SPSS) version 24. A P-value < 0.05 was considered statistically significant.

Results:

Out of 321 medical students, 186 (57.9%) were females, and 135 (42.1%) were males, with no general differences regarding the addiction score. Social media was the leading platform for internet use purposes (88%), mean internet addiction score was 47.7; most of the respondents (55.8%) fit into the moderate-level addiction. There is an association between the duration of internet time consumption and the IAT score, with 5-6 hour/day scoring the highest (mean 50.1 ± 14.3) (P-value 0.001). There is a significant association between platforms that consume most of the participant time and IAT score, with games scoring the highest (IAT mean 56.4 ± 15) (P-value 0.001). There is an insignificant negative correlation between Internet Addiction Test (IAT) grade and CGPA (p-value 0.07).

Conclusion:

The mean internet addiction score is 47.7, and most of the respondents (55.8%) show moderate-level addiction. The Internet Addiction Test’s application to medical students’ sample concerning the academic performance found no significant association between Internet Addiction Test score and CGPA score.

1. Introduction

The internet is the basis of the revolution of information technology [1]. Social networks play a vital part in learning environments as a primary communicational channel and social support source [2]. Generally, the development of new technologies such as the internet, social networks and providing chances to ease and improve global communications have created some threats [3].

Ivan Goldberg first proposed the term 'Internet Addiction Disorder' for pathological, compulsive internet usage [4]. This disorder's criteria are based on similar substance abuse disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) [5]. However, internet addiction is not included in the official classification system of mental illness and disorder, and there are no formal diagnostic criteria available in the International Classification of Diseases and Related Health Problems (ICD-10) (WHO, [6]) and DSM-5 [7], except online gaming disorder.

Young defined it as "an individual's inability to control his or her use of the internet, which eventually causes psychological, social, school, and/or work difficulties in a person's life" [8]. Some authors mention that excessive internet use could be addictive behavior with mental health consequences [9–11]. Psychological and environmental factors in college students' lives may make them vulnerable to internet addiction [8, 12].

Internet addiction among students has received considerable scholarly attention in recent years as students are among the most critical internet and social networks. The addiction to social networks has positive and negative academic, social and health implications [13]. Although a small fraction of students uses the internet for educational activities in a controlled way, a large percentage keeps wasting time by visiting 'non-educational' sites [14]. Some studies suggest that social media sites affect students' lives and their academic achievement, and the duration of their studies [15, 16]. Internet addiction seems to be a relatively common behavioral addiction, and its prevalence has been approximately estimated just above or below 10% in different studies [17–20]; likewise, in studies performed on medical and allied health students, similar percentages have been reported [21, 22].

As internet access is becoming widespread, problematic internet use is increasingly being reported [23]. Internet addiction is an emerging psychological problem across the globe. One report mentioned that internet addiction directly impacts depression, anxiety, and stress [24]. Worldwide, the number of internet users was 3.9 billion, up from 3.65 billion in the previous years, and 2.31 billion persons are social media users, delivering 31% global penetration [25, 26]. Using the internet among students cannot be overemphasizing. Many students consider using social media sites as part of their lives [27]. It was found in one study that 90% of college students were Facebook users [28]. According to our data, the prevalence of internet addiction and its association with academic performance among Sudanese medical students has not been discussed yet. Therefore, this study aimed to assess the effects of internet addiction on medical students' academic performance at Omdurman Islamic University, which admitted online learning to compensate for the lockdown since the first attack of the coronavirus pandemic in the first half of 2020.

2. Materials And Methods

2.1 Participants:

This study was a cross-sectional study conducted on medical students at Omdurman Islamic University in Sudan. Medical students from the 2nd, 3rd, 4th, and 5th class who are using the internet for one year or more were included.

The sample size was 321 that were calculated using the following sample size:

$$n = N / (1 + (Ne^2))$$

n = sample size

N = total population

e = level of precision

A proportional stratified random sampling technique was used for recruitment into the study. The sample was stratified by the grade of the students, including class two until class five. The number of students recruited for each class is shown in (Table 1):

Table 1
Number of students
recruited for each class.

Class	Number
2 nd Class	85
3 rd Class	83
4 th Class	67
5 th Class	86
Total	321

2.2 Data collection tool

Data were gathered through a questionnaire that contains four sections. The first one is about socio-demographic data, the second one about general questions about time spend on the internet and the type of programs used, the third one is about the Cumulative Grade Point Average (CGPA), which assesses the

academic performance of the participants. The last one is the Internet Addiction Test (IAT), an instrument for diagnosing problematic internet use developed by Young [8], and available online open source. It is a 20-item scale that measures the presence and severity of internet addiction. This test was designed as a research and diagnostic tool based on the DSM-IV criteria for pathological gambling diagnosis. The IAT is a symptom-measuring tool for internet addiction. Internet addiction is defined here as online compulsive behavior that causes hindering normal social interactions and increases daily stress and feelings of solitude, anxiety, and depression. The test measures the degree of involvement in online activities using responses on the 5-degree Likert type scale with a range of 0 to 5 (e.g., How often do you stay online longer than you planned? (0= never; 1= seldom; 2= occasionally; 3= frequently; 4= very often, 5= always)). The total range of the questionnaire is from 0 to 100. Participants can be classified into several categories, and the result of 0 to 19 indicates the absence of addiction, from 20 to 39 indicates a low level of addiction, and the average online user, from 40 to 69, represents a moderate level of addiction. In contrast, the result of 70 to 100 assumes a severe level of internet addiction.

2.3. Procedure

As our study was conducted in unusual circumstances, there were restrictions on most activities and movements, and person-to-person contacts are maximally reduced for fear of the spread of COVID-19 infection. Data collected using an internet-mediated questionnaire, a new valid, cheap and rapidly growing data collection tool in the social sciences.

2.4. Data analysis

Data were analyzed using the statistical package for social science (SPSS) version 24, after being primarily analyzed by Google Form. Descriptive analysis was used to describe the demographic data, time spent on the internet, type of programs used, CGPA and severity of the addiction. Demographic data, time spent on the internet and type of programs used were compared to the addiction score by ANOVA or T-tests after doing normality test for addiction score. The internet addiction score was compared with CGPA using Spearman correlation. Mean and the standard deviation was calculated for numerical variables like CGPA of participants, whereas frequency and percentage for categorical variables like gender and categories of each questionnaire item. The data presented in tables and charts. A P value < 0.05 considered statistically significant.

3. Results

In this study, we enrolled 321 medical students; the majority were females 186 (58.3%) (Table 2), and their mean age was 22.2 years with a standard deviation of 1.7. The highest Internet addiction score found was 96, and the lowest score was 2. The mean internet addiction score was 47.7, while the mean CGPA was 2.69. Regarding the purpose of internet use, social media was the leading platform (88%). While most of the participants spend 3–4 hours per day (34%), about 28% spend more than six hours per day

on the internet. A total of 23 (7.2%) of respondents show no signs of addiction ($IAT < 20$). About 84 (26.2%) of respondents show a mild level of addiction ($20 \leq IAT \leq 39$), and most of the respondents, 179 (55.8%), fit into the moderate-level addiction category ($40 \leq IAT \leq 69$), 35 (10.9%) of respondents are in the category of severe addiction level ($IAT \geq 70$) (Fig. 1).

Table 2

Association between demographic characteristics, duration of internet time consumption, platforms and IAT score.

Variables		N (%)	IAT score Mean ± (SD)	P- value
Age	18–22	187 (58.3)	48.7 (18.5)	.44
	23–27	133 (41.4)	46.1 (18.1)	
	28–32	1 (.3)	43	
Gender	Male	135 (42.1)	47.6 (17.1)	.12
	Female	186 (57.9)	47.6 (19.3)	
Marital status	Single	309 (96.3)	47.6 (18.3)	.61
	Married	12 (3.7)	46.9 (20.3)	
Academic level	2nd class	85 (26.5)	42.8 (17.8)	.092
	3rd class	83 (25.9)	47.6 (17.5)	
	4th class	67 (20.9)	49.8 (18.9)	
	5th class	86 (26.8)	49.3 (18.7)	
Duration of internet time consumption	Less than an hour	5 (1.6)	45.2 (15.7)	< .001
	1–2 hour/day	33 (10.3)	33.7 (18)	
	3–4 hour/day	109 (34)	41.2 (17.2)	
	5–6 hour/day	84 (26.2)	50.1 (14.3)	
	More than 6 hour/day	90 (28)	45.2 (15.7)	
Platforms that consume most of the participant time	Games	11 (3.4)	56.4 (15)	.001

Variables		N (%)	IAT score Mean ± (SD)	P- value
	Learning sites	27 (8.4)	35.4 (22.6)	
	Social media	283 (88.2)	48.4 (17.6)	

We found an association between the duration of internet time consumption and the IAT score, with 5–6 hour/day scoring the highest (mean 50.1 ± 14.3). Also, there is a significant association between platforms that consume most of the participant time and IAT score, with games scoring the highest (IAT mean 56.4 ± 15) (Table 1). We found an insignificant negative correlation between IAT grade and CGPA (P-value = .07) (Table 3).

Table 3
Correlation between IAT score and CGPA score

CGPA score		
IAT score	<i>r</i>	P value
	-.073*	.07
* Correlation is significant at 0.05 level (2-tailed).		

4. Discussion

Several studies have been conducted globally, especially among students concerning internet addiction. Our study was an initial step toward understanding the extent of internet addiction among medical college students (29).

The Mean internet addiction score in the current study was 47.7, which is considered higher than the study done by Muhammad Alamgir Khan (Mean = 38) (1) and Akhtar (Mean = 39.23) (30). Regarding the purpose of internet use, most of the participants select social media (88%), which was lesser than the study done in Turkey that assessed social media usage by medical students (93.4%) (31). We found that most participants (88.2%) spend 3 hours or more per day on the internet. Students' time on social networks highlights that medical students have been spending significant time on these social networks. These results were consistent with a study performed on the students of the University of Baghdad (2018) and University of Babylon (2017) (32,33), which demonstrated that a significant proportion of students spent more than three hours per day on social networks.

Those who reported using the internet for the educational sites were (8%), which was considered higher than an Indian study, which only found that (0.1%) of participants are using the internet for educational purposes (29).

Most of the respondents in our study show a moderate level of addiction (55.8%). In contrast to a study done by Cynthia that found most of the students are mild addicts (52.6%) (34), and another one has done in Iran, which found that the larger percentage show a mild form of internet addiction (51.3%) (35).

The level of severe internet addiction in the current study was considered to be high (%10.9), severe addiction was found to be only (0.9%) In a study done among Iranian students and was not observed at all in Cynthia's study (34).

Internet addiction in this study was higher than other studies in terms of mean internet addiction score and number of severe internet-addicted individuals that may be due to the lockdown and a dramatic increase in internet usage in all aspects of life to the COVID-19 pandemic. Decreasing everyday social interaction and global direction toward online learning makes students seek other like social media alternatives to share their feelings and ideas.

A recent study done by Blossom Fernandes shows that the use of social media, streaming services and gaming sites and apps significantly increased during lockdown (36).

Young students with no enough sense of responsibility to be addicted to social media as it is increasingly available, which can explain the findings that said there is a significant association between platforms that consume most of the participant time and IAT score, with games scoring the highest (IAT mean 56.4 ± 15) (P-value = .001).

In line with the current study findings, recent studies found no difference between male and female social media use among medical students (37–39).

In contrast to our study, Andreassen et al. (2017) showed that being female is one of the factors that have a statistically significant relationship with social networking addiction (40), which was surprisingly in contrast with other previous studies that found males have higher addiction than females (41,42).

Increased use of the internet via laptops, smartphones, tablets and other handheld devices, along with cheaper data services, make internet use more widespread. Some studies found that students using social media to communicate with their colleagues and for learning, and many students rely on social media to access the knowledge in a free and easy way (43).

Our study not in agreement with many studies (44–49) that revealed a negative and significant correlation between internet addiction and academic performance. Specifically, during those years as COVID-19 stay-at-home directives considered a unique situation that made decision-maker at educational institute establish online learning as a right choice for continuing the learning process, so students have to be in touch and update themselves. However, internet use has positive and negative consequences, so there is a study (50), which confirmed that most students agreed that social networking media have a positive influence on their academic performance. Finally, and surprisingly, our study is similar to other studies (41,51–55) that found no correlation between social internet addiction and academic

performance as the majority found to be addicted by the screening regardless of high or low the CGPA seems like a matter of time management.

5. Conclusion

This study reveals only 7.2% have no internet addiction. The mean internet addiction score is 47.7, and most of the respondents (55.8%) shows moderate-level addiction. Despite that, the Internet Addiction Test's application to the sample of medical students concerning academic performance found no significant association between Internet Addiction Test score and CGPA score.

Limitations Of The Study

This study had several limitations. The cross-sectional nature of the study is one of them. As our study tracks the overall accumulative academic performance with addiction degree at the time of study only, there may be a failure to detect or underestimate new onset of the negative impact of new-onset addictive behavior in some respondent (which may be raised significantly at last year due to COVID-19 lockdown). Other limitations are the small sample size, single-center and internet-mediated questionnaire.

Recommendations

As there is a relatively high prevalence of addiction, real intervention and awareness of complete addiction evaluation via specialists need to be carried on. There is low usage of the internet for learning purposes, raising awareness about the benefits of online learning websites. Further studies should be conducted after the period of COVID-19 lockdown.

Declarations

Ethics approval and consent to participate

The ethical clearance was obtained from the Research Ethical Committee (REC), Faculty of Medicine, Omdurman Islamic University. Written consent was taken from participants through the questionnaire. Informed consent to participate in study was taken from all participants. All methods were performed in accordance with the relevant guidelines and regulations.

Consent for publication

Not applicable.

Availability of data and materials

The materials datasets used and/or analyzed during this study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors participated in planning the study, data collection, introduction and methods sections. SBH and YAA analysed the data and participated in the result section. THMA and KAAM participated in the discussion section. YAA and SBH participated in the conclusion and limitation sections. AAMM checked the grammar mistakes. NEOSH was responsible for reviewing the article.

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Figures

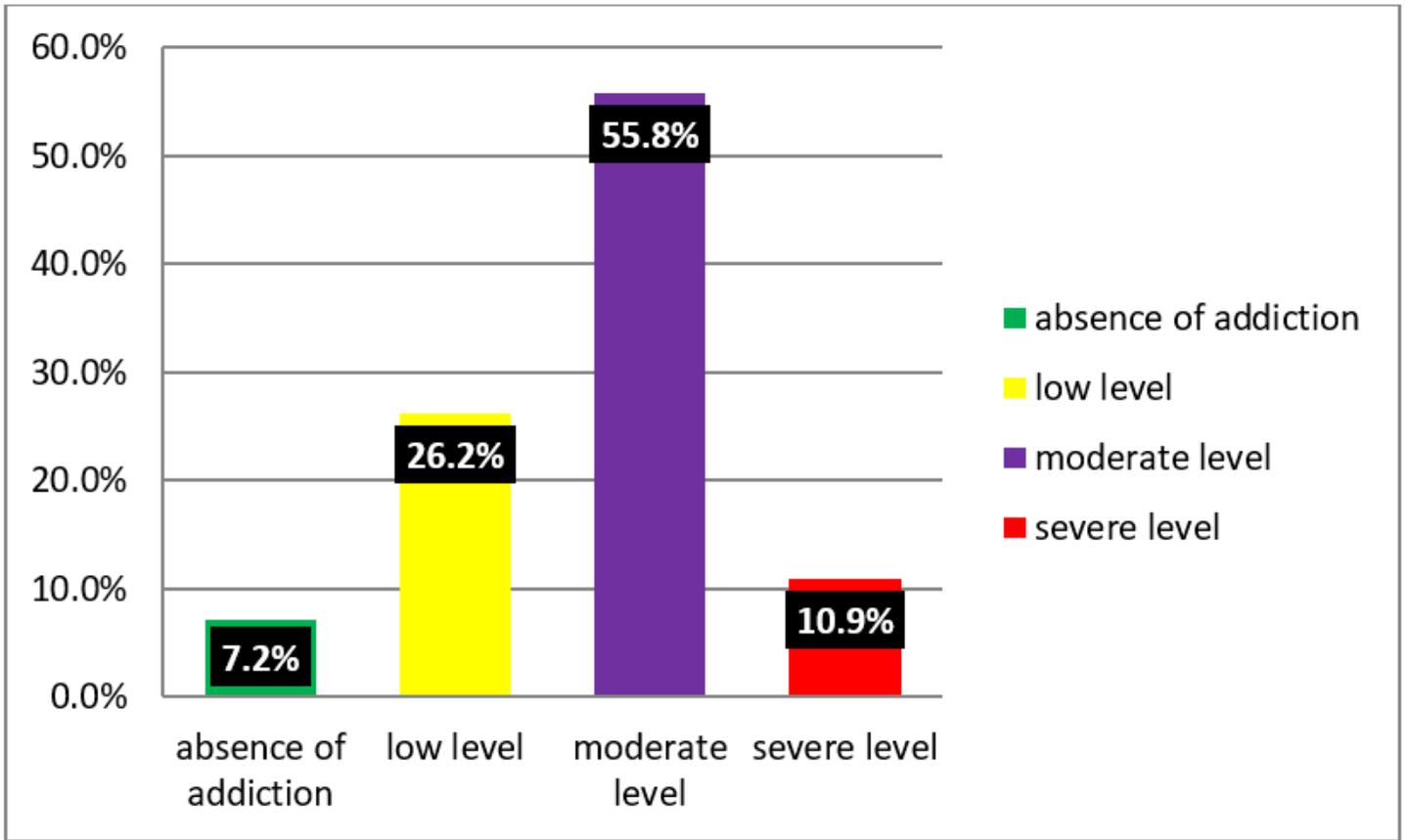


Figure 1

Severity of addiction