Internet Addiction and Internet Gaming Disorder and Associated Insomnia among a Sample of Al-Azhar University Students, Clinical Study

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ABSTRACT

Objective: The aim of this cross-sectional study was to examine and compare the prevalence of internet addiction and internet gaming disorder with examination of related sleep problems. Also identifying risk factors associated with them .

Patients and methods: Data were collected from 60 students of Al-Azhar University. From randomly selected 6 different faculties. We found a high prevalence rate of Internet Addiction (IA) among them. This prevalence was higher than Internet Gaming Disorder (IGD) prevalence. Both of IA and IGD are inversely correlated to sleep quality. Theoretical faculties are at higher risk for IA and IGD.

Middle Socioeconomic status (SES) of adolescents' parents is related to IA but not related to IGD. The study was approved by the medical ethics committee of Al-Azhar University Hospitals and a written informed consent was obtained from all patients.

Results: According to the results of the Internet Addiction Test (IAT), 46.7% of the sample had moderate internet addiction, 3.3% had severe internet addiction and 40% had mild internet addiction. According to results of (IGD) Scale 50% were at risk to develop Internet Gaming Disorder (IGD)&13.6% were disordered. According to Pittsburgh Sleep Quality Index (PSQI), (60%) of the participants were suffering from poor sleep Quality.

Conclusion: The current study has revealed a high prevalence rate of Internet Addiction (IA) among Al-Azhar university students. This prevalence was higher than Internet Gaming Disorder (IGD) prevalence. Both of IA and IGD are inversely correlated to sleep quality.

Keywords: IAT, IGD, PSQI, DSM–5.

INTRODUCTION

Internet addiction is a global phenomenon that has been a topic of increasing interest to clinicians, researchers and stakeholders such as teachers, parents and community groups. Clinical research on behavioral addictions investigated many models of addiction: compulsive gambling**,** overeating, and compulsive sexual behavior. Similar addiction models have been applied to technological overuse [1]**.**

Generally speaking, IA has been characterized by excessive or poorly controlled preoccupation, urges, and/or behaviors regarding internet use that lead to impairment or distress in several life domains [2].

In contemporary society approximately 40% of the world population is online. Furthermore, global internet usage has grown nearly six-fold over the last decade [3]. The percentage of internet users in Egypt was 21.6% in 2010, which became 37.82% in 2015 (around 35 million users) [4]. Beard recommends diagnostic criteria of Internet Addiction. Five criteria are needed for diagnosis between pre-occupation, loss of control, negative mood if kept offline and negative consequences from pathological internet usage [5].

Internet gaming is one of the most popular internet activities. It can be pleasurable and rewarding but some individuals develop pathological manner of usage of such activity. Through the past few years, researchers' interest towards this pathological behavior increased and Internet Gaming Disorder (IGD) was listed in Diagnostic and Statistical Manual

of Mental Disorders (DSM–5). As mentioned in DSM-5, IGD is persistent and recurrent use of the internet to engage in games, often with other players, leading to clinically significant impairment or distress [6].

No doubt that the internet became an integral part of our life. Also sleep maintains our homeostatic function. We need both of them but how they could affect each other is one of the important issues that recent studies started to demonstrate. Excessive internet use leads to irregular sleep patterns due to an irregular bedtime schedule, and this could lead to disturbed circadian rhythm [7]. Some researchers found that not only internet addiction may affect sleep but also people who suffer from decreased ability to fall asleep at night, would engage in internet usage more than others keeping them at higher risk of internet addiction [7].

AIM OF THE WORK

The aim of this study was to:

1. Comare the Prevalence of internet addiction & internet gaming disorder among the selected population.

2. Assess essential risk factors (sex, socio-economic class, role of theoretical & practical faculties) of both internet addiction and internet gaming disorder.

3. Explore the associated insomnia among the pathological users.

4. Measure its impact on the academic achievement

Patients and Methods:

This cross-sectional study applied during the academic year 2018-2019 in Al-Azhar University, 200 questionnaires were randomly distributed to 200 students from 6 faculties of Al-Azhar University students (Commerce, Education, Shariaa, Medicine, Science, and Engineering). Due to the lack of cooperation of some students the number of questionnaires collected was 160, 40 questionnaires were excluded for incomplete data filling, then 60 questionnaires were excluded because of presence of psychiatric symptoms by SCID1.

Assessment and statistics were conducted on 60 students. The range of their age was 18-26 years with mean of 21.9 ±2.7, and 53.3% of the sample were females and 46.7 % were males.

The assessment made by informative designed questionnaire [8], SCID1, (SES) Scale, (IAT) [9], (IGD) Scale [10], (PSQI) [11].

Ethical and approval considerations:

Oral and written consents were taken from the students taking into considerations maintaining the confidentiality of the data. In addition, **approval of the Ethical Committee of Psychiatry Department, Al-Azhar University also was taken to do the research.**

Inclusion Criteria:

- Being a student of Al-Azhar University.

- Age range: 18 – 26 years old.

- Both sexes.

Exclusion Criteria:

-Students who have psychiatric symptoms by SCID1 or receiving psychiatric medications.

Statistical analysis:

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

The following tests were done:

- Independent-samples t-test of significance was used when comparing between two means.

- Chi-square (x^2) test of significance was used in order to compare proportions between two qualitative parameters.

- The confidence interval was set to 95% and the margin of error accepted was set to 5%. The p-value was considered significant as the following:

- Probability (P-value)
    - P-value <0.05 was considered significant.
    - P-value <0.001 was considered as highly significant.
    - P-value >0.05 was considered insignificant.

RESULTS

Table (1): Personal characteristics of the sample.

		N	%
Age (Yr)		21.9 ± 2.7	
Sex (n %)	Males	28	46.7%
	Females	32	53.3%
SES (n %)	Low	3	5%
	Middle	36	60%
	High	21	35%
Faculty (n %)	Commerce	11	18.3%
	Shariaa	10	16.7%
	Education	10	16.7%
	Medicine	10	16.7%
	Science	10	16.7%
	Engineering	9	15%
Grades of the past	Excellent	5	8.3%
year	V. Good	14	23.3%
	Good	22	36.6%
	Accepted	14	23.3%
	Failed	5	8.3%

Our sample consisted of 60 students of Al-Azhar University. The range of their age was 18-26 years with mean of 21.9 ± 2.7, and 53.3% of the sample was females and 46.7 % were males. Most of the sample was of middle socioeconomic level (60%). Data was collected from 6 different faculties. Grades of the students were divided into Excellent, Very Good, Good, Accepted, Failed. All of those characteristics are displayed in **Table (1).**

Table (2): Prevalence of internet addiction among selected sample, and the most visited sites:

		N	%
Internet Addiction	Normal	6	10%
(n %)	Mild	24	40%
	Moderate	28	46.7%
	Severe	2	3.3%
Most visited site	Social Media	53	88.3%
(n %)	Information Surfing	4	6.7%
	Internet Gaming	2	3.3%
	Pornographic Sites	1	1.7%
Hrs. online/day		5.7 ± 1.9	

Students used the internet for about 5.7 ± 1.9 hours/day and most of them using it for more than 1 year. According to the results of the Internet Addiction Test (IAT), 46.7% of the sample had moderate internet addiction. Through asking the students about the most visited sites we found that 88.3% from them were using the social media.

Table (3): Online gaming behavior

		N	%
Playing online Games	No	38	63.3%
	Yes	22	36.7%
Type of online Games	MMO	10	45.5%
	Not MMO	12	54.5%
Internet Gaming Disorder (Among players only)	Normal	8	36.4%
	Risky	11	50%
	Disordered	3	13.6%

Results showed that 63.3% from the students were not using online games. Among the rest of the sample 50% were at risk to develop Internet Gaming Disorder (IGD). Also, we found that 45.5% from game players use Massive Multiplayer Online (MMO) games.

According to Pittsburgh Sleep Quality Index (PSQI), 36 persons (60%) of the participants were suffering from poor sleep Quality.
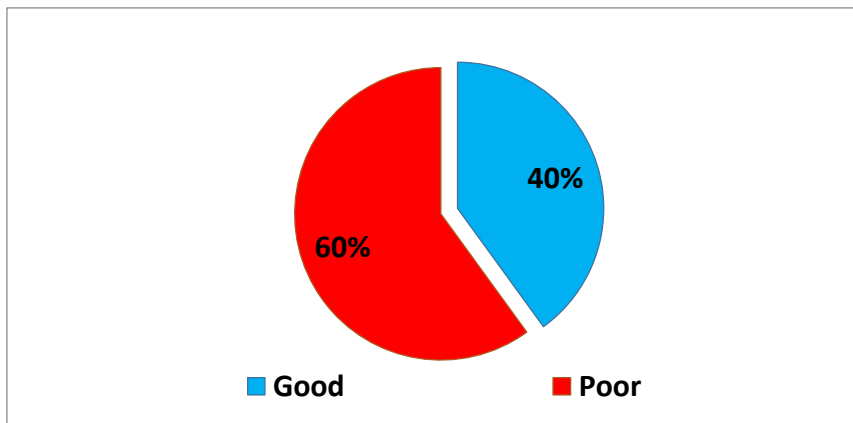

Fig. (1): Sleep Quality of the students

Essential relations:

Table (4): Relation between internet addiction and personal characteristics

		Normal (n = 6)		Mild (n = 24)		Moderate (n = 28)		Severe (n = 2)		P	Sig
		N	%	N	%	N	%	N	%		
Sex	Males	4	66.7%	15	62.5%	16	57.1%	1	50%	0.94	NS
	Females	2	33.3%	9	37.5%	12	42.9%	1	50%		
Faculty	Commerce	1	16.7%	4	16.7%	0	0%	2	100%	< 0.001	**HS**
	Shariaa	1	16.7%	9	37.5%	0	0%	0	0%		
	Education	2	33.3%	3	12.5%	18	64.3%	0	0%		
	Medicine	1	16.7%	3	12.5%	10	35.7%	0	0%		
	Science	1	16.7%	2	8.3%	0	0%	0	0%		
	Engineering	0	0%	2	8.3%	0	0%	0	0%		
Grades	A	1	16.7%	3	12.5%	2	7.1%	1	50%	0.0002	**HS**
	B	2	33.3%	7	29.2%	6	21.4%	0	0%		
Of the	C	3	50%	9	37.5%	10	35.7%	0	0%		
past	D	1	16.7%	5	20.8%	10	35.7%	0	0%		
year	F	0	0%	0	0%	0	0%	1	50%		
	Low	3	50%	2	8.3%	1	3.6%	0	0%		

SES	Middle	3	50%	13	54.2%	18	64.3%	0	0%	0.008	S
	High	0	0%	9	37.5%	9	32.1%	2	100%		

NS: not significant S: significant HS: highly significant

Table (5): Relation between internet addiction and sleep quality.

		Internet Addiction								P	Sig
		Normal (n = 6)		Mild (n = 24)		Moderate (n = 28)		Severe (n = 2)			
		N	%	N	%	N	%	N	%		
Sleep	Poor	1	16.7%	1	4.2%	8	28.6%	2	100%	**0.004**	S
	Good	5	83.3%	23	95.8%	20	71.4%	0	0%		

S: significant

This table shows statistically significant (p-value < 0.05) correlation between sleep quality and internet addiction.

Table (6): Relation between internet gaming disorder (IGD) and personal characteristics

		Internet Gaming Disorder						P	Sig
		Normal (n = 8)		Risky (n = 11)		Disordered (n = 3)			
		N	%	N	%	N	%		
Sex	Male	5	62.5%	7	63.6%	2	66.7%	0.99	NS
	Female	3	37.5%	4	36.4%	1	33.3%		
Faculty	Commerce	0	0%	1	9.1%	2	66.7%	0.021	S
	Shariaa	0	0%	2	18.2%	0	0%		
	Education	0	0%	2	18.2%	0	0%		
	Medicine	2	25%	4	36.4%	1	33.3%		
	Science	1	12.5%	2	18.2%	0	0%		
	Engineering	5	62.5%	0	0%	0	0%		
Grades Of the past year	A	1	12.5%	1	9.1%	1	33.3%	0.88	NS
	B	1	12.5%	3	27.3%	0	0.0%		
	C	2	25.0%	1	9.1%	1	33.3%		
	D	1	12.5%	3	27.3%	0	0.0%		
	F	2	25.0%	2	18.2%	1	33.3%		
SES	Low	2	25.0%	3	27.3%	1	33.3%	0.98	NS
	Middle	3	37.5%	5	45.5%	1	33.3%		
	High	3	37.5%	3	27.3%	1	33.3%		

NS: not significant S: significant HS: highly significant

This table shows: No statistically significant (p-value > 0.05) correlation between (Sex and internet gaming disorder), (grades and internet gaming disorders) and (SES and internet gaming disorder). Statistically significant (p-value < 0.05) correlation between faculty and internet gaming disorder.

Table (7): Relation between internet gaming disorder and sleep quality.

		Internet Gaming Disorder						P	Sig
		Normal (n = 8)		Risky (n = 11)		Disordered (n = 3)			
		N	%	N	%	N	%		
Sleep	Poor	6	75%	9	81.8%	0	0%	0.039	S
	Good	2	25%	3	27.3%	3	100%		

S: significant

This table shows statistically significant (p-value < 0.05) correlation between sleep quality and internet gaming disorder.

Table 8: Relation between internet addiction and internet gaming disorder.

		Internet Addiction								P	Sig
		Normal (n = 6)		Mild (n = 24)		Moderate (n = 28)		Severe (n = 2)			
		N	%	N	%	N	%	N	%		
Internet Gaming Disorder	Normal	4	66.7%	10	41.7%	8	28.6%	0	0%	0.015	S
	Risky	2	33.3%	12	50%	15	53.6%	0	0%		
	Disordered	0	.0%	2	8.3%	5	17.9%	2	100%		

S: significant

This table shows statistically significant (p-value < 0.05) correlation between internet addiction and internet gaming disorder.

DISCUSSION

This work is a cross sectional study in Al-Azhar University on 60 of the university students (age range 18-26 year), It was found that 91% from the selected sample suffer from internet addiction symptoms with different grades (mild, moderate and severe addiction) according to Internet Addiction Test [12].

Such a high result agreed with previous researches that showed a higher risk of Internet Addiction among adolescents [13] specially university students because of lack of monitoring and presence of more free time [14].

Most of the students in this research, about 89% of them, selected social media as the most visited sites. A study in Tanta University reported that 93% of students were using Facebook [15]. The higher they feel gratified while using social networks the more likely they report Internet Addiction symptoms [16].

Nowadays, social networks sites e.g. Facebook can be easily accessed by smart phones and free applications **WU et al.** [17] which increase the risk of Internet Addiction.

As regards severe Internet Addiction, in the current study, we found that 25% of pornographic sites users are severely addicted compared by 4% of social media users and 0% of other sites' users who exhibited milder form of Internet Addiction this may related to cross cultural differences.

Another popular internet activity is internet games. Only 36% from our sample were using on-line games and 48% from gamers (about 18% from the whole sample) were at risk to develop Internet Gaming Disorder (IGD) while 16% of gamers were disordered (about 6% of the whole sample). In other studies, we could notice different prevalence rates this may be related to cross cultural differences and the use of different criteria and tools for diagnosis.

One of the aims of the current study was to test some factors that may influence internet usage e.g. socioeconomic status (SES), gender and type of faculty (theoretical or practical).We randomly selected 3 practical faculties (Medicine, Engineering and Science) and 3 theoretical faculties (Shariaa, Education and Commerce) and found a high significant relation between faculties and internet behavior. For example, in faculty of Education 66% from participants were at risk to develop IGD in comparison to 63% of engineering students were normal gamers. Also, regarding Internet addiction 62% of participants from faculty of Shariaa were moderate internet addicts but only 36% from faculty of medicine were moderate addicts. It could be because of more free time available to students of

theoretical faculties that expose them to higher risk of IA and IGD [16].

In our study, about 45% of participants were males and 55% were females and no significant correlation was found between both genders and either Internet Addiction or IGD. Many studies considered male gender as a risk factor for internet addiction because of high association between them [18]. However, other studies showed no specific difference between both genders **Reda et al.** [19] also **Young** [20] presented a case of homemaker female who increased her usage of chatting, searching for belonging and emotional support. Such a case would change the schemata of the excessive internet user as a young male theme. This discrepancy between findings of association between gender and Internet Addiction may be related to factors affecting the selected sample e.g. cultural factors and problem awareness [21].

Misuse of the internet has lots of negative consequences e.g. disturbed sleep pattern [20], decreased academic achievement [22], sedentary lifestyle with its side effects [23]. In the current study we have tried to test some of the negative effects of misuse of internet.

We tested sleep quality of students using the Pittsburgh Sleep Quality Index (PSQI). A high significant correlation between sleep quality and Internet Addiction (IA) was revealed as we found that 72% from severe internet addicts were suffering from poor sleep quality. Sleep quality and IA are not only related to each other but also correlated i.e. the more severe the internet addiction, the lesser the sleep quality. Nearly the same results were reported regarding relation between IGD and sleep quality. As we found that 69% from disordered gamers and 67% from risky gamers were suffering from poor sleep quality. Also, a high significant correlation between IGD and sleep quality was noticed. Such results agree with other studies which reported that excessive internet use leads to irregular sleep patterns and poor quality of sleep due to an irregular bedtime schedule [24]. Also, this could lead to disturbed circadian rhythm [25].

Disturbed sleep pattern, due to late night log-ins, causes excessive fatigue often making academic or occupational functioning impaired and may decrease one's immune system,

leaving the patient vulnerable to diseases [20]. In current study, 97.3% reported losing sleep, either always, often, frequently, occasionally or rarely, due to engaging into online activities (25% from them were "always" doing so). However, some researchers found that not only internet addiction may affect sleep but also people who suffer from decreased ability to fall asleep at night, would engage in internet usage more than others keeping them at higher risk of internet addiction [25].

Although the internet is one of the educational tools, many researchers reported a relation between internet excessive use and decreased academic achievement. For example, **Young** [26] found that 58 % of those identified as excessive users also received poor grades. Similarly, **Shields and Kane** [22] found that students' grades were negatively associated with time spent online. In our study, we found that the mean hours students spent online were 5.74 (±SD 3.82). Another study has shown a relationship between problematic Internet use and poor motivation to study, especially in self-generated motivational domains [27].

Also, we noticed that the grades of students deteriorate while the severity of IA increases and 98% from those who failed in exams were internet addicts. Also, a high significant correlation has been found between IGD and students' grades.

Conclusion:

Internet, the global network, is a double-edged sword. It provides us with lots of information, communication facilities, and many other benefits in work, education, and even leisure time. However, Internet misuse may disrupt different life aspects in the form of family problems, education or academic deterioration, even developmental and physical state may be affected because of the sedentary life and poor care of self.

The current study has revealed a high prevalence rate of Internet Addiction (IA) among Al-Azhar university students. This prevalence was higher than Internet Gaming Disorder (IGD) prevalence. Both of IA and IGD are inversely correlated to sleep quality. Theoretical faculties are at higher risk for IA and IGD. Middle Socioeconomic status (SES)

of adolescents' parents is related to IA but not related to IGD.

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