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Psychiatric Disorders Associated with Internet Addiction in A Sample of Preteens Attending Damietta Specialized Hospital

Shimaa Mohamed Arafa
Demonstrator of Psychiatry Department, Faculty of Medicine for Girls, Al-Azhar University, Cairo, Egypt, docshaimaa919@gmail.com

Rania Hussein Mohammed
Professor of Psychiatry Department, Faculty of Medicine for Girls, Al-Azhar University, Cairo, Egypt

Shaimaa Younes Abd Elaziz
Assistant Professor of Psychiatry Department, Faculty of Medicine for Girls, Al-Azhar University, Cairo, Egypt

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ORIGINAL ARTICLE

Psychiatric Disorders Associated with Internet Addiction in a Sample of Preteens Attending Damietta Specialized Hospital☆

Shimaa Mohamed Fawzy Arafa*, Rania Hussein Mohammed, Shaimaa Younes Abd Elaziz

Psychiatry Department, Faculty of Medicine for Girls, Al-Azhar University, Cairo, Egypt

Abstract

Background: **High prevalence rates of internet addiction (IA) have become a global phenomenon; yet, these percentages differ from region to country. The use of different disease classifications or diagnostic criteria may explain these differences. IA is frequently difficult to diagnose. In contrast to drug dependency and substance misuse, the internet offers some distinct benefits. We aimed to review IA, assess psychiatric disorders, and detect the relationship between IA and psychiatric disorders in preteens.**

Patients and methods: **This observational cross-sectional study was performed on 317 preteens aged from 9 to 12 years old and using internet who were not yet diagnosed as IA or psychiatric disorders. Those preteens were subjected to complete medical and neurological history and examination, complete psychiatric interview based on The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria, IA test, and mini-international neuropsychiatric interview for children and adolescents.**

Results: **Mood disorders were significantly higher in preteens with IA than those with no IA ($P = 0.049$). Anxiety disorders were significantly increased in preteens with IA compared with those with no IA ($P < 0.001$). Obsessive compulsive disorder was significantly higher in preteens with IA than those with no IA ($P = 0.044$). TIC disorders were found to be significantly more frequent in preteens with IA compared with those with no IA ($P = 0.045$). Behavioral disorders were significantly increased in preteens with IA than those with no IA ($P < 0.001$).**

Conclusion: **Preteens with IA suffered from psychiatric disorders in more frequencies than those with no IA and these differences were significant except for substance use disorder and suicide.**

Keywords: Attention deficit hyperactivity disorder, Internet addiction, Internet addiction test, Psychiatric disorders

1. Introduction

The first research on internet addiction (IA) was conducted in 1996, and the results were submitted to the American Psychological Association.[1]

Over the past decade, the concept of IA has increased in terms of its acceptability as a serious psychiatric problem often requiring treatment. As additional research is completed, the American Psychiatric Association has agreed to add the IA diagnosis to the The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) Appendix.[2]

About 40 % of the world's people are online right now, which is a big jump from just a few years ago. Over the last 15 years, the Internet has become a vital resource for education, entertainment, communication, and information sharing. The increased popularity and frequency of Internet use has resulted in the appearance of clinical cases exhibiting signs of abuse.[3]

Increased IA prevalence rates have become a global phenomenon; yet, these percentages differ from nation to nation. The use of varied condition classifications or diagnostic criteria may account for these distinctions.[4]

☆ Affiliations: This work was done at Damietta Specialized Hospital, Egypt, Damietta, Egypt.

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* Corresponding author at: Cairo, Egypt.
E-mail address: docshaimaa919@gmail.com (S.M.F. Arafa).

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There are five distinct types of Internet dependency: cyber sex addiction (cybersex), Cyber addiction relational (virtual relations), addiction to online gaming (virtual games or roles), IA or information overload (obsessive search for information), Computer-dependent, or computer addiction.[5]

Young has proposed indicators that indicate a youngster or adolescent is abusing the Internet.[6,7]

Frequently, IA is difficult to diagnose. In contrast to chemical dependency and substance misuse, the Internet provides some clear advantages. Clinical evaluations frequently include relevant disorders for mental diseases and addiction disorders. Frequently, the client does not present with computer addiction complaints. People may initially present with symptoms of depression, bipolar illness, anxiety, or obsessive-compulsive tendencies, only for the treating physician to discover, upon deeper evaluation, indicators of Internet abuse.

Young internet-dependent patients exhibited elevated rates of psychiatric comorbidity, including behavioral, anxiety, and mood disorders. Due to the fact that the presence of psychiatric disorders may affect the management and prognosis of IA, it is crucial to screen for other psychiatric disorders.[8]

The increased usage of the Internet is connected with a number of social and psychological factors, including shrinking social circles, melancholy, loneliness, poorer self-esteem and life satisfaction, poor mental health, and diminished family function.[9]

IA is usually related with psychiatric problems such as anxiety, depression, conduct disorder, and attention deficit hyperactivity disorder (ADHD).[10]

We conducted this study to review IA in preteen., to assess psychiatric disorders in preteens, and to detect the relation between IA and psychiatric disorders in preteens.

2. Patients and methods

This observational cross-sectional study was performed on 317 preteens (boys and girls) aged 9–12 years old who use the internet in Damietta. Those preteens are not yet diagnosed with IA or psychiatric disorders. The study was performed during the period from April 2021 to October 2021 at the pediatric outpatient clinic and department in Damietta Specialized Hospital, Egypt (Approval number: 202102624). All patients' families were given informed written consent.

Exclusion criteria included patients with serious medical conditions or intellectual disability.

The children underwent complete medical and neurological history and examination, complete psychiatric interview based on DSM 5 criteria, IA Test, and Mini-International Neuropsychiatric Interview for Children and Adolescents.

2.1. Statistical analysis

The statistical analysis was performed using SPSS v27 (IBM, Armonk, NY, USA). The distribution of numerical data was analyzed using the Shapiro-Wilks normality test and histograms to decide whether parametric or nonparametric statistical testing was more appropriate. The F test was used to compare the three groups using the mean and SD of parametric variables, and the Tukey test was used to compare each pair of groups. Factors that contribute to IA were determined using a logistic regression analysis. Within-group comparison of two variables using the paired T-test. The statistical significance of categorical variables expressed as frequency and percentage was determined using the χ^2 test. To be statistically significant, the two-tailed P value needed to be less than or equal to 0.05.

3. Results

Table 1 demonstrates the prevalence of IA among the studied sample.

The mean age of IA group was insignificantly higher than those with no addiction (10.12 and 9.97 respectively). Preteens with IA were found to live with both parents in significant lower frequency than their comparable group (53.5 % and 65.2 % respectively). Parents of IA children were found to be educated more frequently than those of non-addiction children with significant differences. Both groups had almost the same number regarding working of their both parents (47.6 % vs. 47.0 %, respectively). A highly significant difference was recorded regarding overuse of the internet among family members as more than half of children with IA (57.8 %) recorded this behavior versus only 0.8 % of their counterparts (Table 2).

Preteens with IA were observed to suffer from all psychiatric disorders in more frequencies than those with no IA and these differences were significant except for substance use disorder and suicide. It was found that obsessive-compulsive disorder (OCD) was significantly higher in preteens with IA compared with those with no IA (3.8 % vs.0.0 %,

Table 1. Internet addiction among the studied sample.

Internet Addiction		
Yes	185	58.4 %
No	132	41.6 %

Table 2. Distribution of socio-demographic data in relation to internet addiction among the studied sample.

	Internet addiction		*P* value
	Yes (185)	No (132)	
Age/years			
mean ± SD	10.12 ± 1.14	9.97 ± 1.14	0.262
Sex			
Male	101 (54.6 %)	62 (47.0 %)	0.181
Female	84 (45.4 %)	70 (53.0 %)	
Residence			0.003*
Urban	113 (61.1 %)	58 (43.9 %)	
Rural	72 (38.9 %)	74 (56.1 %)	
Living with			
Both parents	99 (53.5 %)	86 (65.2 %)	0.018*
Mother	53 (28.6 %)	38 (28.8 %)	
Father	11 (5.9 %)	3 (2.3 %)	
Other personnel	22 (11.9 %)	5 (3.8 %)	
Parents Education			
educated	159 (85.9 %)	102 (77.3 %)	0.046*
not educated	26 (14.1 %)	30 (22.7 %)	
Working of both Parents			
Yes	88 (47.6 %)	62 (47.0 %)	0.916
No	97 (52.4 %)	70 (53.0 %)	
Over use of internet among family member			
Yes	107 (57.8 %)	1 (0.8 %)	<0.001*
No	78 (42.2 %)	131 (99.2 %)	

$P = 0.044$). TIC disorders were found to be significantly more frequent in preteens with IA compared with those with no IA (10.8 % vs. 4.5 %, $P = 0.045$) (Table 3).

Preteens with IA were found to suffer from all mood disorders in more frequencies than those with no IA (3.2 %, 2.2 %, and 1.1 % for major depressive disorder (MDD), dysthymia, and bipolar disorder, respectively) in IA group and (0.8 %, 0.8 %, and 0.0 % for MDD, dysthymia, and bipolar disorder, respectively) in no IA group without significant differences. Preteens with IA were found to suffer from all mood disorders in more frequencies than those with no IA (3.2 %, 2.2 %, and 1.1 % for MDD, dysthymia, and bipolar disorder, respectively) in the IA group and (0.8 %, 0.8 %, and 0.0 % for MDD, dysthymia, and bipolar disorder, respectively) in no IA group without significant differences. Preteens with IA were found to suffer significantly more from all anxiety disorders than those with no IA (2.2 %, 4.9 %, 17.8, 3.8 %, 9.2 %, and 1.6 % in IA group versus 1.5 %, 3.0 %, 5.3 %, 3.8 %, 3.0 %, and 0.0 % in no IA group)

Table 3. Distribution of psychiatric disorders in relation to internet addiction among the studied sample.

	Internet addiction		*P* value
	Yes (185)	No 2(132)	
Mood Disorders			0.049*
No	173 (93.5 %)	130 (98.5 %)	
Yes	12 (6.5 %)	2 (1.5 %)	
Anxiety Disorders			<0.001*
No	104 (58.2 %)	108 (81.8 %)	
Yes	81 (41.8 %)	24 (18.2)%	
OCD			
No	178 (96.2 %)	132 (100 %)	0.044*
Yes	7 (3.8 %)	0	
Substance Use Disorder			
No	184 (99.5 %)	132 (100 %)	1.00
Yes	1 (0.5 %)	0	
Suicide			
No	184 (99.5 %)	132 (100 %)	1.00
Yes	1 (0.5 %)	0	
TIC Disorders			
No	165 (89.2 %)	126 (95.5 %)	0.045*
Yes	20 (10.8 %)	6 (4.5 %)	
Behavioral Disorders			
No	97 (52.4 %)	113 (85.6 %)	<0.001*
Yes	88 (47.6 %)	19 (14.4 %)	

Table 4. Distribution of psychiatric disorders in relation to internet addiction among the studied sample in details.

	Internet addiction		*P* value
	Yes (185)	No (132)	
Mood disorders			
MDD	6 (3.2 %)	1 (0.8 %)	0.137
Dysthymia	4 (2.2 %)	1 (0.8 %)	0.322
Bipolar Disorder (Mania)	2 (1.1 %)	0	0.230
Anxiety disorders			
Agoraphobia	4 (2.2 %)	2 (1.5 %)	0.676
SAD	9 (4.9 %)	4 (3.0 %)	0.416
Social Phobia	33 (17.8 %)	7 (5.3 %)	<0.001*
Specific Phobia	7 (3.8 %)	5 (3.8 %)	0.988
GAD	17 (9.2 %)	4 (3.0 %)	0.029*
Panic disorder	3 (1.6 %)	0	0.141
More than one	8 (4.3 %)	0	0.015*
TIC disorders			
Motor	13 (7.0 %)	3 (2.3 %)	0.056
Transient	7 (3.8 %)	3 (2.3 %)	0.447
Behavioral disorders			
ADHD(I)	39 (21.1 %)	9 (6.8 %)	<0.001*
ADHD(H)	2 (1.1 %)	1 (0.8 %)	0.796
ADHD(C)	7 (3.8 %)	2 (1.5 %)	0.230
Conduct Disorder	6 (3.2 %)	3 (2.3 %)	0.600
(ODD)	22 (11.9 %)	4 (3.0 %)	0.004*
More than one disorder	12 (6.5 %)	0	0.002*

Table 5. Logistic regression analysis of significant factors affecting internet addiction.

Factors affecting internet addiction	β coefficient	Significance
Sex (male/female)	0.67	0.030*
Residence (Urban/rural)	0.72	0.015*
Over use of internet among family members (yes/No)	4.64	0.000*
Presence of Anxiety Disorders (Yes/No)	0.79	0.027*
Presence of Behavioral Disorders (Yes/No)	1.18	0.002*
Constant	−3.65	0.000

for Agoraphobia, SAD, social phobias, specific phobias, generalized anxiety disorder (GAD), and panic disorder. It was found that both motor and transient disorders were more frequent among children with internet disorder than those without internet disorder (7 % and 3.8 % for motor and transient disorders respectively in the first group vs. 2.3 % for each disorder in the second group) but the differences were insignificant. Preteens with IA were found to suffer from all types of behavioral disorders in more significant frequencies than those with no IA [21.1, 1.1, 3.8, 3.2, and 11.9 % for attention deficit hyperactivity disorder (ADHD) (I), ADHD(H), ADHD(C), conduct disorder, and ODD, respectively] in IA group and (6.8, 0.8, 1.5, 2.3, and 3.0 % for each type, respectively) in no IA group. Moreover, 6.5 % of IA preteens had more than one behavioral disorders comparing to no one of the no IA group with significant differences (Table 4).

Overuse of the internet among family members was the most predictor factor for IA followed by the presence of behavioral disorders then the presence of anxiety disorders, being male gender, and residing in urban areas with values of β coefficient as follows: 4.64, 1.18, 0.79, 0.72, and 0.67 for each factor, respectively (Table 5).

4. Discussion

These critical issues are attracting a great deal of societal attention and necessitating urgent research into the mechanisms underlying IA and depression among Egyptian pediatrics and adolescents. Very few studies have been conducted in Egypt to address the issue of problematic internet use (PIU), particularly among preadolescent children.

The relation between IA and psychiatric disorders in preteens was another objective.

Our research revealed that 4.4 % of the sample examined was affected by mood disorders. Except for substance use disorder and suicide, all psychiatric disorders were statistically significantly more prevalent among preteens with IA than among those without IA.

Preteens with IA were found to suffer from all mood disorders in more frequencies than those with no IA Among different levels of IAs. The differences were statistically insignificant except for major depressive disorder in severe level of IA.

In agreement with the present study, Li et al.[11] statistically distinguishing IA from MDD and bipolar disorder.

The present study was supported by the meta-analysis by Ho *et al.*[12] who conducted a cross-sectional, case-control, and cohort studies that investigated the relation between IA and psychiatric co-morbidity. In the meta-analysis, eight studies were included, and the incidence of depression among IA patients was determined to be 26.3 % (95 % confidence interval: 17.6–37.4 %, z = −3.93, df = 4, 2 = 0.30, I2 = 88.99). The prevalence of depression among normal controls was 11.7 % (95 % confidence interval (CI): 8.8–15.5%, Q = 10.205, df = 4, $P = 0.001$, 2 = 0.11, I2 = 92.57). cant due to their negative effects,[13] and evidence suggests a strong correlation between IA and depression.[14] For instance, a study of 34 diverse high schools in Western Australia[15] discovered that IA (such as addiction to social networking sites) may result in depression.

Preteens with IA were found to suffer significantly more from all anxiety disorders than those with no IA. Moreover, 4.3 % of IA preteens had more than one anxiety disorders comparing to no one of the no IA group.

Our results was supported by the meta-analysis by Ho *et al.*[12] who revealed that 23.3 % of IA patients exhibited anxiety (95 % confidence interval: 14.8–34.8, z = −4,156, df = 3, 2 = 0.27, I2 = 84.37). The prevalence of anxiety among normal controls was 10.3% (95 % confidence interval: 5.0–19.9, z = −5.47, df = 3, 2 = 0.59, I2 = 97.9) The percentage of patients with anxiety symptoms was substantially increased in the IA group than in the control group (pooled odds ratio = 2.70, 95 % CI (CI): 1.44–4.97, z = 3.02, $P = 0.001$). A significant variability was found across studies (2 = 0.293; Q = 16.0, df = 3, $P = 0.001$, I2 = 81.2).

In agreement with current study, Yayan *et al.*[16] studied the relationship between IA and social phobia was found to be positive in a study involving 24 260 students between the ages of 11 and 15. Internet use and social phobia had a positive correlation.

Also, the present study was supported by Elavarasan *et al.*[17] who reported that 52.5 % of adolescents with IA were diagnosed with social phobia. Compared with students without IA, students with IA have 3 times the risk of developing social anxiety and 4 times the risk of depression development.

However, Ko *et al.*[18] stated that social phobia had no effect after control of depression and ADHD.

Furthermore, in line with our findings Kim *et al.*[19] stated that GAD, have also been related to PIU, the same results.[20]

The present study revealed that there was found that both motor and transient disorders were more frequent among children with internet disorder than those without internet disorder (7 % and 3.8 % for motor and transient disorders respectively in the first group and 2.3 % for each disorder in the second

group) but the differences were statistically insignificant.

In line with the present study Li *et al.*[11] stated that there was a statistically significant difference between IA and ADHD.

Also, Bozkurt *et al.*[8] found that the incidence of behavioral problems was (86.7 %), including ADHD (83.3 %) and Inattentiveness (Inattentive Disorder) (43.3 %). There is a significant correlation between the extraordinarily high occurrence of behavioral disorders and IA. The ADHD-inattention subtype was shown to be more prevalent than other subtypes, with a higher incidence among females than men (60 % vs. 37 %). There is little data in the literature about the subtype of ADHD in IA individuals.

The present study was supported by the meta-analysis by Ho *et al.*[12] who stated that 21.7% of IA patients were found to have ADHD (95 % CI: 18.6–25.0 %, z = −13.283, df = 3, 2 = 0.005, I2 = 12.4). ADHD prevalence among normal controls was 8.9% (95 % CI: 7.9–10.1 %, z = −35.0, df = 3, 2 = 0.004, I2 = 22.59). Significantly more ADHD patients were found in the IA group than in the control group.

Also, in agreement with the present study, Gunes *et al.*[21] revealed a significant correlation between oppositional defiant disorder (ODD) and IA severity score.

Regarding Suicide in IA subjects, the present study found that suicide was recorded only among severe level of IA (one case).

This agreed with Kim *et al.*[19] who observed that IA was related to depression and suicide addiction.

We found that OCD was significantly increased in preteens with IA than those with no IA (3.8 % vs. 0.0 %, $P = 0.044$).

Also, in agreement with the present study, Jang *et al.*[22] observed that there was a highly significant statistical difference between Nonaddiction, IA, and Addiction groups as regard obsessive-compulsive disorder.

Regarding substance use disorder, the present study showed that substance use disorder was recorded only among severe level of IA (one case).

Volkow and Li,[23] have suggested that the susceptibility of a person to alternate reinforcers would be reflected in the addiction-prone phenotypes of drug use disorders. Consequently, teenagers and college students prone to drug use disorders would also be susceptible to IA if the Internet had the potential to be addictive.

The study by Bozkurt et al.[8] stated that the incidence of substance use disorder between IA cases 6.7 %.

Family members were the strongest predictor of IA, followed by the presence of behavioral disorders, then the presence of anxiety disorders, being male, and residing in urban areas, with coefficient values of 4.64, 1.18, 0.79, 0.72, and 0.67 for each factor, respectively. However, Bener *et al.*[24] using multivariate regression, the duration of Internet use, physical and mental symptoms, headache, eye pain, eye tiredness, hearing issues, and the Epworth Sleepiness Scale were observed to be strongly linked with (and key predictors of) IA.

Also, Li et al.[11] reported that poor relation with parents ($P = 0.001$, OR = 2.34, 95 % CI: 1.49–3.68) and high total PHQ-9 scores ($P = 0.001$, OR = 1.19, 95 % CI: 1.16–1.21) were linked to a higher risk of IAD. On the other hand, doing more physical activity every day ($P = 0.04$, OR = 0.67, 95 % CI: 0.46–0.98) and living in a rural area ($P = 0.003$, OR = 0.62.

4.1. Conclusion

Preteens with IA were observed to suffer from psychiatric disorders naming (mood disorders, behavioral disorders, OCD, anxiety disorders, TIC disorders, substance use disorder and suicide) more frequently than those with no IA, and these differences were significant except for substance use disorder and suicide. A highly significant difference was found between IA and social phobia, ADHD (I), and ODD. OCD and GAD were significantly higher in IA group than no IA Preteens with IA had more than one anxiety disorders and more than one behavioral disorders compared with the no IA group, with significant difference.

Regarding factors affecting IA, overuse of the internet among family members was the most predictor factor for IA followed by the presence of behavioral disorders, then the presence of anxiety disorders, being male gender, and residing in urban areas.

Important starting points for additional research are: notably, older adolescents are sampled disproportionately in the literature on preteens and IA, and there is a dearth of information on internet use between children and preteens, despite the evidence that they frequently use the internet for activities like gaming and social media such as YouTube.

4.2. Recommendations

To validate our conclusion, additional research on a larger geographical scale with larger sample sizes is required.

When designing prevention and treatment programs, the intensity of IA must be taken into

consideration. To encourage healthy and secure internet usage, it is vital to create both techniques for preventing IA and providing therapies.

To illustrate the cause-and-effect processes between IA and mental disorders in preteens, prospective research incorporating more psychiatric comorbidities is necessary to better acknowledge the relationship between IA and psychiatric co-morbidities. Due to its significance and role in personality formation, preadolescent development should be studied.

Authors' contribution

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by S M A and R H M. The first draft of the manuscript was written by S Y A E and S M A, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Authorship

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by S M A and R H M. The first draft of the manuscript was written by S Y A E and S M A, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Presentation meeting

Nil.

Conflicts of interest

Nil.

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