Psychiatric symptoms associated with internet addiction among Suez Canal University students

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Objective
Until now, there are debates on existence and classification of internet addiction and if it is an independent mental disorder or a symptom of other mental disorders. Therefore, in the current study, we tried to assess the association of psychiatric symptoms with internet addiction among Suez Canal University students to enhance understanding of psychiatric symptoms as risk factors for internet addiction. Thus, preventive and treatment measures could be taken.
Patients and methods
One-hundred students were assessed in a cross-sectional case–control study using clinical interview and internet-addiction test for internet addiction and Mini International Neuropsychiatric Interview Scale for psychiatric symptoms.
Results
Our results revealed that depression, social phobia, obsessions, obsessive–compulsive disorder (OCD), bulimia nervosa, and psychosis are significantly associated with internet addiction. However, logistic-regression analysis revealed that depression, social phobia, obsessions, and OCD are the only predictors of internet addiction with the presence of obsessions as the most powerful predictor.
Conclusion
Students who have obsessions, OCD, social phobia, and depression could be more vulnerable to internet addiction. Thus, treatment and preventive approaches targeting those symptoms or disorders are important for clinicians to know because they could be helpful in reduction of the big problem of internet addiction.

Keywords:
internet addiction, psychiatric symptoms, university students

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Introduction

Currently, internet addiction has become a global mental health problem, especially among young people. Although the internet has a positive effect on our life through learning, gathering information, and communicating with others, on the other hand, when it is used excessively and in unhealthy pattern, it could become an addictive behavior that affects academic, occupational, and social function of persons (Mihajlov and Vejmelka, 2017). Until now, there are arguments about the concept of internet addiction as an independent mental disorder and some researchers believe that the internet is just a medium for activities not a substance and state that internet addiction might be better explained as a part of or manifestation of other primary mental disorders. Therefore, it seems important to understand the association between internet addiction and other psychiatric disorders to shed light on the etiology of internet addiction (Shaffer *et al.*, 2000; Recupero, 2010; Ko *et al.*, 2011; Mihajlov and Vejmelka, 2017).

Several studies (Mueser *et al.*, 1998; Kessler, 2004; Pani *et al.*, 2010) had reported comorbidity between addictive behavior in general and psychiatric disorders, and suggested four possible mechanisms for it, including: the psychiatric disorder can contribute to the symptoms of the addictive disorder, or the addictive disorder may lead to other psychiatric disorders, or there are underlying common mechanisms shared by both addictive and psychiatric disorders and last, other factors related to methodology of study (Ko *et al.*, 2011). A review by Kuss *et al.* (2014) on comorbidities of mental disorders and internet addiction found that depression, anxiety disorders, as well as attention-deficit/hyperactivity disorder have been considered as three main comorbid conditions of internet-use disorders. Other comorbid features include harmful alcohol use, compulsivity, sleeping

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disorders, hostility, dissociative experiences, and depersonalization.

Therefore, cases of internet addiction should be screened for any comorbid psychiatric symptoms or disorders. Also, more studies are needed to investigate temporal relationships, prognosis of this comorbidity on both disorders, and whether the treatment for comorbidity can benefit the case of internet addiction. So, in our study, we tried to enhance understanding of psychiatric symptoms as risk factors behind internet addiction. Findings that may strengthen treatment and preventive strategies of internet addiction.

Patients and methods

Methods

The study was carried out as a cross-sectional, case–control study during the period from January 2018 to January 2019. We selected 100 students from different faculties of Suez Canal University (including Faculty of Medicine, Nursing, Arts, and Education) by using convenience-sampling method.

Patients

Patients included both sexes of students, those aged 18–30-year-old, both undergraduates and postgraduates, and those using the internet for at least 1 year. Internet-addicts group included those who score 50 or more on internet-addiction test and the control group was matched for sociodemographic criteria and included those scoring less than 50 on the internet-addiction test.

Study measurements

(1) Questionnaire for sociodemographic data and pattern of internet usage.
The questionnaire included items about age, sex, faculty, educational grade, marital status, residence, and socioeconomic status. Also, it included enquiry about patterns of internet usage such as device and place of usage, the most used activities, duration of usage, and frequency of usage per week and per day.

(2) Assessment of internet addiction.
A standard clinical interview was used for assessment of internet addiction based on a modified version of the DSM-IV-TR criteria for pathological gambling (American Psychiatric Association, 2000). Also, clinical assessment was supported by using the Arabic version (Yacoub and Gaefar, 2014) of self-rating, Young (1998) internet-addiction test.

(3) Assessment of psychiatric symptoms using the Mini International Neuropsychiatric Interview (MINI), 5.0.0, DSM-IV (Sheehan *et al.*, 1997).

Psychiatric symptoms were assessed by using the Arabic version of MINI scale that was validated in a previous study carried out in Egypt (Ghanem, 2000). The MINI is a brief structured interview for most of Axis-I psychiatric disorders in DSM-IV and ICD-10. These disorders include major depressive episode, dysthymia, suicidality, manic or hypomanic episode, panic disorder or symptoms, social phobia, agoraphobia, obsessions or obsessive–compulsive disorder, post-traumatic stress disorder, substance abuse, psychotic disorders, anorexia and bulimia nervosa, and generalized anxiety disorder and antisocial personality disorder.

Statistical analysis

All data were analyzed using SPSS version 18.0 NC. USA.SAS institution (SPSS, 2002). Descriptive statistics were calculated for the sample population, and the group differences were compared for quantitative variables with Student's t test and analysis of variance. Differences among categorical variables were analyzed using the χ^2 test or two-tailed Fisher's exact test as appropriate. Logistic-regression analysis was also done to assess predictable variables of internet addiction.

Results

Our study included two groups, the control group that includes normal and mild internet users (33 and 17 students), respectively, and the internet-addiction group that includes moderate and severe internet users (40 and 10 students), respectively. The sociodemographic results of our study population revealed that mean age of participants was 23.4 ±3.77 years with a female proportion of 60%. Most of the study population (76%) were single and live in urban areas. About 69% of the study population were of a practical college (medicine and nursing) and 62% of the study population were undergraduates. In addition, the findings revealed no statistically significant association between sociodemographic parameters and internet addiction in the two studied groups, except significant association between college type and internet addiction, 80% of addicted students were from practical faculties as shown in Table 1.

Regarding the association with the frequency of internet usage, the results showed that there is statistically significant association between the frequency of usage per week and per day and internet addiction (P=0.001 and P<0.001), respectively, as shown in Fig. 1.

Regarding the association of psychiatric symptoms with internet addiction, our study showed that among different psychiatric disorders assessed by MINI, there is statistically significant association between some psychiatric symptoms and disorders and internet addiction as shown in Fig. 2. Internet-addict group has the following percentages in comparison with controls, they represented 59.3% of those having recent depression, 68% of socially phobic persons, 80% of persons with bulimia nervosa, 87.5% of those having psychotic disorder, and 100% of those having mood disorder with psychotic symptoms. While the association of obsessive symptoms and obsessive–compulsive disorder (OCD) with internet addiction is statistically highly significant, 94.4 and 93.8% of students with obsessions and OCD, respectively, were internet addicts.

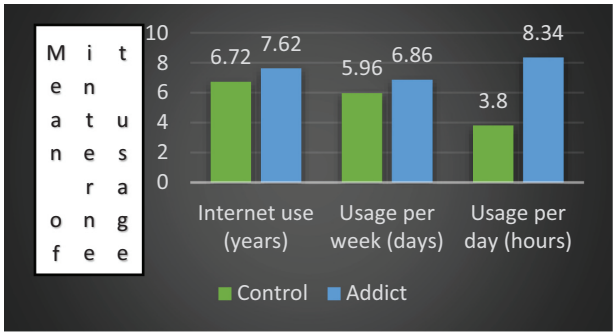
When analyzing the association between psychiatric symptoms and severity of internet addiction (normal, mild, moderate, and severe users), the results confirmed the significant association with obsessive symptoms, OCD, psychotic disorder, mood disorder with psychotic symptoms, and bulimia nervosa that was also found in Fig. 2.

Table 1 Association between sociodemographic parameters and internet addiction in studied groups

Groups	Control (N=50)	Addict (N=50)	P value
Variables			
Attributes	*n* (%)	*n* (%)	
Age (years)			
Mean±SD	23.78±3.88	23.06±3.58	0.337
Sex			
Male	18 (36)	22 (44)	0.414
Female	32 (64)	28 (56)	
Marital status			
Single	39 (78)	37(74)	
Married	9 (18)	8 (16)	0.497
Divorced	2 (4)	5(10)	
Widow/er	0	0	
Socioeconomic status			
High	19 (38)	22 (44)	
Average	31 (62)	28(56)	0.542
Low	0	0	
Residence			
Urban	34 (68)	42 (84)	0.061
Rural	16 (32)	8 (16)	
Academic grade			
Undergraduate	32 (64)	30 (60)	0.680
Postgraduate	18 (36)	20 (40)	
College type			
Practical (1)	29 (58)	40 (80)	0.017*
Theoretical (2)	21 (42)	10 (20)	

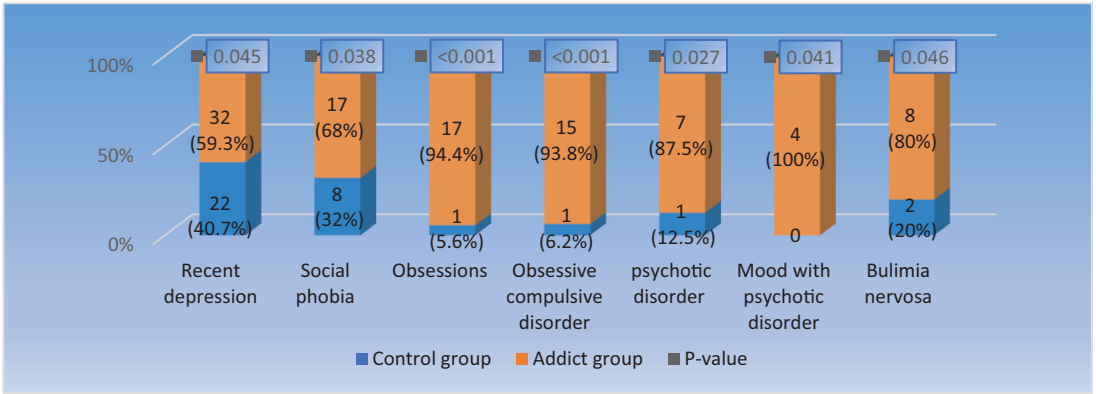
(1) Practical college includes medicine and nursing.
(2) Theoretical includes others (Faculty of Education and Arts).
*Statistically significant P value less than 0.05.

Figure 1



Association between the frequency of internet usage and internet addiction.

Figure 2



The most significant psychiatric symptoms and disorders associated with internet addiction in two groups.

In addition, the results showed that there is statistically significant association between history of depression, panic symptoms and PTSD, and severity of internet addiction. However, the findings revealed no statistically significant association between suicidal risk and internet-addiction groups as shown in Table 2.

Logistic-regression analysis was done to assess which of psychiatric symptoms or disorders are predictors of internet addiction. Of all psychiatric disorders, recent depression, social phobia, obsessions, and OCD were found to be significant predictors. Obsessions were observed to be the most powerful predictor of internet addiction, persons with obsessions are 25.24 times more likely to have internet addiction than normal. Conversely, recent depression was observed to be the weakest predictor of internet addiction, persons with depression are only 2.26 times more likely to have internet addiction than normal as shown in Table 3.

Discussion

The main aim of this study was to enhance understanding of psychiatric symptoms as risk factors behind internet addiction. Our study revealed that there is a statistically significant association between internet addiction and depression, social phobia, psychotic disorder, mood disorder with psychotic symptoms, and bulimia nervosa, and a highly significant association with obsessive symptoms and OCD. Also, panic symptoms and PTSD were found to be significantly associated with severity of internet addiction in addition to the above-mentioned psychiatric symptoms. Logistic-regression analysis revealed that obsessions, OCD, social phobia, and depression are the only predictors of internet addiction.

Table 2 Association between suicidal risk according to Mini International Neuropsychiatric Interview and internet addiction in studied groups

Groups	Control	Addict	*P* value
Variables			
Attributes	*n* (%)	*n* (%)	
Suicidal-risk grades			
No risk	29 (58)	29 (58)	
Low risk	16 (32)	12 (24)	
Moderate risk	4 (8)	5 (10)	0.478
High risk	1 (2)	4 (8)	
Total	50 (100)	50 (100)	

Table 3 Logistic-regression analysis of psychiatric symptoms as predictors of internet addiction

Psychiatric disorder	B	*P* value	Odds ratio	95% confidence interval of odds ratio
Recent depression	0.817	0.046*	2.263	1.013–5.052
Social phobia	0.995	0.041*	2.705	1.04–7.036
Obsessions	3.229	0.002*	25.242	3.203–198.948
OCD	3.045	0.004*	21.000	2.649–166.454

OCD, obsessive–compulsive disorder.
B: this is the coefficient for the constant in the null model.
*Statistically significant *P* value less than 0.05.

In agreement with our findings, some studies found a significant association between depression and internet addiction. They found that depressed people are more vulnerable to internet addiction (Orsal *et al.*, 2013; Papastylianou, 2013; Alzayyat *et al.*, 2015; Othman and Lee, 2017; Park *et al.*, 2017; Elavarasan *et al.*, 2018; Farahani *et al.*, 2018; Sevelko *et al.*, 2018; Mamun *et al.*, 2019). Although there is a difference in population, culture, assessment tools, and sample size between studies, these consistent findings suggest that internet use may provide a space for persons to escape from stress or sadness in the real world, also points to the importance of depression as a risk factor or a consequence to internet addiction. Therefore, the causal correlation between depression and internet addiction needs to be further assessed in longitudinal and prospective studies.

Regarding anxiety disorders, other studies were in harmony with our findings and revealed significant association with social phobia. They found that persons with social phobia are more vulnerable to internet addiction (Reda *et al.*, 2012; Park *et al.*, 2017; Elavarasan *et al.*, 2018; Farahani *et al.*, 2018). This harmony may suggest that people with social phobia are trying to avoid face-to-face interactions by using online communication. However, in contrast to our findings, other studies found significant association with specific phobia and GAD (Reda *et al.*, 2012; Park *et al.*, 2017). Park *et al.* (2017) found significant association with PTSD that is partly consistent with our findings. While Othman and Lee (2017) did not find significant association with anxiety disorders. Different target population, assessment methods, and the role of other psychiatric symptoms may explain these inconsistent findings.

Regarding other mental disorders, Sevelko *et al.* (2018) revealed significant association with eating disorders as our study, but Farahani *et al.* (2018) did not. In addition, Budak *et al.* (2015) and Park *et al.* (2017) revealed significant association with OCD, which is consistent with our findings. These findings may

suggest common pathophysiological mechanisms associated with compulsive behaviors.

Speaking about the association of substance-use disorders with internet addiction, no one in our study reported substance abuse. So, we could not assess this association. However, previous studies found a significant positive association (Park *et al.*, 2017; Farahani *et al.*, 2018; Sevelko *et al.*, 2018). These findings could suggest common etiology between substance and behavioral addiction.

Although our study found no significant association with suicidal risk, Kim *et al.* (2017) found that participants with internet addiction showed more frequent history of suicidal ideation and plan, whereas no significant differences were found with previous suicide-attempt history. Also, Cheng *et al.* (2018) found significant association with suicidal ideation, planning, and attempts, and higher severity of suicidal ideation, especially in children (age <18 years) than in adults. This inconsistency with our study can be explained by different assessment tools between studies, our small sample size, and narrow age range.

Logistic-regression analysis confirmed the significance of obsessions and OCD as the most powerful predictors of internet addiction among different psychiatric disorders, which revealed the importance of screening for internet addiction among patients with obsessions and OCD, and searching for psychiatric comorbidity in persons having internet addiction. Recent depression, however, was found to be the weakest predictor of internet addiction and this can be explained by the presence of the large percentage of depression in the control group. These findings clarify the importance of other symptoms, disorders, and other factors as risk factors behind internet addiction. To our knowledge, psychosis is not reported by participants and not much studied in previous studies (Farahani *et al.*, 2018). Therefore, more studies are needed to prove the association with those mental disorders that are not thoroughly studied and to prove causal relationships between mental disorders and internet addiction.

Study strengths and limitations

Our study had some limitations, which can affect generalization of the study results to the whole population, which includes a narrow range of ages and using convenience-sampling method in choosing participants. In addition, using the cross-sectional method of the study may limit the possibility of drawing conclusions regarding causal relationships. Despite these limitations, our study has some strength points in the form of using clinical interview beside psychometric tools in assessment in contrast to many studies that use online assessment.

Conclusions and recommendations

There are certain psychiatric symptoms and disorders that can be considered as risk factors for internet addiction and clinicians should be aware of them because they can become useful in treatment and prevention of internet addiction. Those disorders include depression, social phobia, obsessions, OCD, bulimia nervosa, and psychosis. However, depression, social phobia, obsessions, and OCD were found to be the only predictors of internet addiction with the presence of obsessions as the most powerful predictor. Therefore, we recommend that persons presented with internet addiction should be screened for those psychiatric symptoms. Good management of those symptoms may help in management of internet addiction. Also, educational and preventive programs should be directed toward college students about the harms of excessive internet use, coping skills, and management of stress. Finally, further studies are needed in our culture to verify and extend the presented results.

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Conflicts of interest

There are no conflicts of interest.

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