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Prevalence of Internet Addiction and its association with depression, anxiety and stress among Medical Students in Malaysia

Ali Sabri Radeef [1], Ghasak Ghazi Faisal[2]

[1] Department of Psychiatry, Kulliyyah (Faculty) of Medicine, International Islamic University Malaysia, Jalan Hospital Campus 25150, Kuantan, Pahang, Malaysia

[2] Department of Fundamental Dental and Medical Sciences, Kulliyyah (faculty) of Dentistry, International Islamic University Malaysia, Indera Mahkota Campus, 25200 Kuantan, Pahang, Malaysia.

Email Corresponding Author: drghassak@yahoo.com

Abstract

Background: Using the internet excessively by students is known to cause internet addiction (IA) which may result in negative consequences such as decline in academic performance, social isolation, and emotional disturbances. This study aims to assess IA and its association with emotional disturbances among medical students.

Methods: A sample of 268 medical students participated in this study. Internet addiction was assessed using Malay version of Chen Internet addiction Scale while the prevalence and severity of depression, anxiety and stress were assessed by Depression Anxiety, Stress Scale (DASS-21).

Results: The rate of IA among students was 22.8%. No significant differences in terms of gender and other socio-demographic factors. IA was significantly associated and positively correlated with depression and anxiety symptoms but has inverse correlation with social interaction. Multiple linear regression analysis showed that stress ($\beta = 0.261$, $P = 0.005$) was a significantly important risk factor.

Conclusions: IA is potentially high among medical students. Male and female students are equally affected. IA is significantly higher among students with poor social interaction. IA has a positive correlation with depression, anxiety and stress symptoms but inverse correlation with social interaction and stress can be considered as a predictive factor for IA.

Key words: Internet addiction, Depression, Anxiety, Stress, Students, Malaysia

Introduction

The use of the internet worldwide is increasing dramatically in recent years. As of December 2017, 54.4% of the world's population are internet users (World Internet Users, 2018). In Malaysia, the Internet Users Survey (IUS) was conducted by the Malaysian Communications and Multimedia Commission (MCMC) showed that 38.1% of internet users were between 20 to 29 years of age and the estimated number of internet users was 24.5 million people in 2016 (Internet Users Survey,2017). In many universities, free unlimited internet service is usually provided to undergraduate students and it is intended to enhance education, communications and research however, excessive/problematic internet use has serious negative outcomes on academic performance (Reed,2015), psychological well-being (Casale 2015), family functioning (Yan 2014) and quality of life (Cheng, 2014).In recent years, the term addiction has been expanded beyond substance dependence to include non-substance-related behaviors that cause problems and impairment (Van Rooij, 2014) .Addiction to a substance and addiction to a behavior may look similar in their effects on behavioral patterns, emotions and physiology(Valentini, 2016). There are several types of behavioral addiction including internet use, gambling, eating, sex, love, exercise, work and shopping(Sussman, 2011). Many terms have been introduced to describe the behavioral problems manifesting from heavy internet use such as internet addiction (IA) (Chou,2005) or “problematic internet use” (Shapira,2003). Internet addition is the most widely used term to describe this maladaptive internet use. The problematic, uncontrollable and impulsive use of the internet has been conceptualized as a behavioral addiction comparable to pathological gambling(Young,2009). IA is an emerging disorder that recently became the focus of many studies, due to to the emergence of clinical cases presenting abuse symptoms. Although IA is not included in the Statistical Manual of Mental Disorders fifth edition (DSM-5), internet gaming disorder has been incorporated into section III of DSM-5(Poli,2017, American Psychiatric Association,2013). Since there are many various tools to measure internet addiction, it is crucial to use a validated and reliable tool such as Chen Internet addiction scale (CIAS). It assesses five domains of Internet-related problems: compulsive use, withdrawal, tolerance, interpersonal and health consequences, and time management difficulties (Chen,2003).

As IA may affect the psychological well-being of the undergraduate students, this will make them more vulnerable to emotional disturbances such as stress, anxiety and depression. Depression is defined by the (DSM-5) as a disorder that is characterized by either a depressed mood or markedly diminished pleasure in all activities in addition to at least four other symptoms within a duration of at least two weeks, these symptoms include, significant weight loss/weight gain, disturbed sleep, diminished concentration, fatigability, psychomotor agitation or retardation, feeling of worthlessness or inappropriate guilt, thoughts of death or recurrent suicidal ideation (American Psychiatric Association,2013). Anxiety is a condition that is characterized by intense feeling of dread, accompanied by somatic symptoms that indicate a hyperactive autonomic nervous system, also it impairs cognition and may produce distortions of perception (Sadock, 2015). Stress can be defined as the physiological and psychological response to events that are appraised as threatening or challenging that require adjustment (Samuel,2004)

This study aimed to determine the prevalence of IA among medical students and to assess the association of IA with emotional disturbances in the form of depression, anxiety and stress among internet addicted students.

Methodology

A prospective cross sectional study was conducted on a sample of 268 undergraduate medical students from International Islamic University Malaysia, Kuantan campus. Prior conducting this study, an ethical approval was obtained from the International Islamic University Malaysia Research Ethics Committee. The details of the study were fully explained and informed consent was obtained from the participants. The participation was entirely on voluntary basis. All participants were ensured of the confidentiality and the gathered information will only be used for research purposes.

The study was conducted in the middle of the course before the examination period so as to minimize the extra stress symptoms.

The participants inclusion criteria are students who agreed to participate in the study and who are able to use the internet.

CIAS is a self-report instrument used to determine IA that is composed of 26 items rated on a 4-point Likert scale. It assesses five domains of Internet-related problems: compulsive use, withdrawal, tolerance, interpersonal and health consequences, and time management difficulties. Scores range from 26 to 104. Higher CIAS scores indicated high severity of addiction to Internet activity (Chen, 2003). The cutoff point of 63/64 and 67/68 of the CIAS were considered to be the best for screening and diagnosis of IA among college students respectively, meaning that 26-63 shows normal use, 64-67 indicates at risk use and need for screening and 68-104 indicates IA (Ko, 2009). In this study, we used the Malaysian version of Chen Internet Addiction Scale CIAS which was translated to Malay language (Bahasa Malaysia) in a previous study with good psychometric properties in terms of reliability (internal consistency) and validity so that this scale is considered as validated and reliable to our population (Radeef, 2018).

The Depression Anxiety Stress Scale (DASS-21) was used to assess emotional disturbances among the medical students. It is a modified self-rated and shorter version as it is a set of three self-report scales designed to assess the severity of the core symptoms of depression, anxiety and stress; it consists of statements referring to the past week. Each item is scored on a 4-point scale (0 = Did not apply to me at all, to 3 = Applied to me very much or most of the time). Subjects are asked to use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. Scores for Depression, Anxiety and Stress are calculated by summing the scores for the relevant items. The following cutoff score is used to assess the presence of the symptoms: Depression ≥10, anxiety ≥8, and stress ≥15. (Lovibond, 1995)

Statistical Analysis

The statistical package for social sciences (SPSS) software version 22.0 was used for both descriptive and inferential analysis. The analysis of the variables such as age group, gender, nationality, monthly household income, marital status, year of study, and type of accommodation were presented in numbers and percentages.

The Kolmogorov-Smirnov tests were used to assess the normality of the distribution of each variable. The univariate association between all demographic variables (Gender, phase of study, family monthly income, age, accommodation, social relationships, time of internet use per week) also emotional disturbances in form of depression, anxiety and stress symptoms with IA was determined using Chi-square.

Then, each of the variables of emotional disturbances whose association got statistical significance in the univariate analysis ($P < 0.05$) was included in a multiple linear regression model for IA . A value of $P < 0.05$ was considered significant.

Results

A total of 268 out of 292 (91.8%) medical students who participated and completed the questionnaires were included in the analysis. The mean age of the participants is 22.87 year-old. Out of 268 participants, 82 (30.6%) were females, 131(48.9) were in pre-clinical phase while 137 (51.1) were in clinical phase of study, 261 (97.4%) were single, 131 (49.2%) have high family income.

The majority of the students 159 (96.6%) stayed at the hostel and the mean duration of internet use was 7.6 years among students with IA.

There was no statistically significant difference in terms of gender, phase of study, family monthly income, accommodation, marital status, age and duration of internet use with IA ($P > 0.05$), while poor social interaction was significantly higher in students with IA ($P < 0.05$). (Table 1).

Table 1: Socio-demographic factors and its association with internet addiction

	Total n (%)	No addiction n (%)	Internet addiction n (%)	P-value
Gender				
Male	82 (30.6)	65 (79.3)	17 (20.7)	0.36
Female	186 (69.4)	142 (76.3)	44 (23.7)	
Phase of study				
Pre-clinical	131(48.9)	100 (76.3)	31 (23.7)	0.42
Clinical	137 (51.1)	107 (78.1)	30 (21.9)	
Family monthly income				
≤ RM1500	33 (12.3)	23 (69.7)	10 (30.3)	0.41
RM 1501-5000	104 (38.8)	79 (76)	25 (76)	
>RM 5000	131 (48.9)	105 (80.2)	26 (19.8)	
Marital status				
Married	7 (2.6)	6 (85.7)	1 (14.3)	0.5
Single	261 (97.4)	201 (77)	60 (23)	
Accommodation				
Hostel	259 (96.6)	57 (22)	202 (78)	0.12
Not in hostel	9 (3.4)	5 (55.6)	4 (44.4)	
Social interaction				
Socially active	137 51.1)	113 (82.5)	24 (17.5)	0.026
Socially inactive	131(48.9)	94 (71.8)	37 (28.2)	

Age (year)	22.9±1.37	22.7±1.08	0.17
Duration of internet use (year)	7.3	7.6	0.59

Table 2 shows the range, mean and standard deviation of scores for scales and subscales of CIAS. In this study, the prevalence of IA among medical students was found to be 22.8% while 12.3% were at higher risk for addiction (table 3).

Table 2: Range, mean, standard deviation for the scale and subscales of Chen Internet Addiction Scale (CIAS)

Variable	Range	Mean	Std. Deviation
Compulsive symptoms (COM)	15 (5-20)	11.56	3.075
Withdrawal symptoms (WIT)	15 (5-20)	12.35	2.853
Tolerance (TOL)	11(5-16)	10.39	1.958
Interpersonal and health problems (IH)	19 (7-26)	15.50	3.499
Time Management Problems (TM)	15 (5-20)	9.78	2.935
Internet Addition Core Symptoms (COM+WIT+TOL)	37 (17-54)	34.29	6.935
Internet Addition Related Problems (IH+TM)	30 (12-42)	25.28	5.457
Total CIAS score (Com + Wit + TOL + IH + TM)	66 (29-95)	59.57	11.204

Table3: Prevalence of internet addiction among medical students.

	Number (%)
No internet addiction	174 (64.9)
At high risk	33 (12.3)
Having internet addiction	61 (22.8)
Total	268 (100)

Table 4 shows that depression, anxiety and stress symptoms were significantly associated with IA ($P < 0.05$).

Pearson correlation test showed that there was positive correlation between symptoms of depression, anxiety and stress with IA but inverse correlation between IA and level of social interaction. The results of multiple linear regression analysis showed that stress ($\beta = 0.261$, $P = 0.005$) was significantly important risk factors for IA among medical students (table 5).

Table 4: association of Internet addiction with depression, anxiety and stress symptoms:

	Total n (%)	No addiction n (%)	Internet addiction n (%)	P-value
Depression				0.001
Normal	162 (60.4)	136 (84.0)	26 (16.0)	
Symptoms of depression	106 (39.6)	71 (67.0)	35 (33.0)	
Anxiety				
Normal	119 (44.4)	105 (88.2)	14 (11.8)	0.000
Symptoms of anxiety	149 (55.6)	102 (68.5)	47 (31.5)	
Stress				
Normal	177 (66.0)	154 (87.0)	23 (13.0)	0.000
Symptoms of stress	91 (34.0)	53 (58.2)	38 (41.8)	

Table 5: Predictors of internet addiction in multiple linear regression analysis

Variable	β	t	95% Confidence Interval for B		Significant
			Lower Bound	Upper Bound	
Depression	0.10	1.21	-0.081	0.339	0.229
Anxiety	0.12	1.40	-0.072	0.425	0.164
Stress	0.27	2.92	0.116	0.593	0.004
Social relationships	-0.07	1.40	-2.517	0.539	0.203

Discussion

In this study, the prevalence of IA among medical students was found to be 22.8% which is lower than that in other previous study among medical students in Malaysia using internet addiction test in which the rate was found to be 36.9% (Ching, 2017) and other study among allied health students found the rate to be 31.8% (Othman, 2017), while our result is slightly higher than that in other study in which a rate of 20.5% of the medical students were identified as dependent Internet users (Siraj, 2015). A previous review in assessing IA has revealed that prevalence rates range from 0.8% to 26.7% as a consequence of different assessment tools and cut-offs (Kuss, 2014). Other factors which may affect the prevalence of IA includes sample size, whether using validated tool or not, sampling method and cultural differences. Other previous studies on IA using CIAS among college students in Pakistan and Taiwan revealed that the prevalence was 28% and 17.9% respectively (Saleem, 2015 and Tsai, 2009). CIAS has been tested to have good psychometric properties and its internal consistency has consistently been shown to be excellent. Its test–retest reliability has been reported to be good: r = .83 and r = .88 (Chen, 2003 and Kesici, 2010) so that CIAS can be considered as an accurate tool for assessing IA in Asian region including Malaysia.

Regarding association of gender with IA studies across the world showed varied results. In some studies, IA is associated with male gender (Ching, 2017, Tsai, 2009 and Salehi, 2013) but in a study done in Japan the rate of IA is more among females (Mihara, 2016).

In this study, there was no statistically significant difference in IA between male and female students which is similar to the findings in previous studies in Malaysia (Haque, 2016 and Usman, 2014) Vietnam (Tran,2017), India (Malviya, 2014) and USA (Beavers, 2015).

Poor social interaction has been found in this study to be significantly associated with IA which is similar to previous studies(Van der,2009 and Liu, 2007).This may be due to excessive internet use and IA can displace valuable time that people spend with family and friends which may result in poor social interaction.

Depression, anxiety and Stress symptoms were significantly associated and positively correlated with IA and this is similar to the findings of previous studies (Othman,2017, Lam,2009, Younes,2016 and Ostovar,2016)

Stress is a predictor for IA in this study which is similar to a previous study in which peer stress as one of the academic stressors among college students was found to be a predictor for IA (D'Souza, 2018) also experience of recent stressful events are potentials risk factors for IA among adolescents (Lam,2009). Since psychological distress is significant among medical students and academic factors are most important stressors[41], it is crucial to implement appropriate intervention strategies and planning to reduce stress since it may affect students psychological well-being in the form of emotional disturbances and IA and also hinder their academic performance.

Conclusion

The present study revealed that IA is potentially high among medical students. Male and female students are equally affected. IA is significantly higher among students with poor social interaction. IA has a positive correlation with depression, anxiety and stress symptoms but inverse correlation with social interaction and stress can be considered as a predictive factor for IA. Strategies are needed for early intervention and prevention of IA and its physical and mental consequences among students. Also measures need to be taken for early identification and intervention of stress for better psychological well-being and academic performance.

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