

Prevalence and factors associated with internet addiction among medical students - A cross-sectional study in Malaysia

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ABSTRACT

Introduction: Internet is important to university students, especially for medical students who use it to search for literature and relevant information. However, some of the users are experiencing a gradual loss of the ability to reduce the duration and frequency of their internet activities, despite the negative consequences. The literature on internet usage among Malaysian medical students is limited. This study aims to determine the prevalence and factors associated with internet usage among medical students in a public university in Malaysia.

Methods: This cross-sectional study was performed among all the medical students (Year 1-5). Students were assessed on their internet activities using the internet addiction questionnaires (IAT). A Multiple Logistic Regression was used for data analysis.

Results: The study was conducted among 426 students. The study population consisted of 156 males (36.6%) and 270 females (63.4%). The mean age was 21.6 ±1.5 years. Ethnicity distribution among the students was: Malays (55.6%), Chinese (34.7%), Indians (7.3%) and others (2.3%). According to the IAT, 36.9% of the study sample was addicted to the internet. Using the multivariate logistic regression analysis, we have found that the use of internet access for entertainment purposes (odds ratio [OR] 3.5, 95% confidence interval [CI] 1.05-12.00), male students (OR 1.8, 95% CI 1.01-3.21) and increasing frequency of internet usage were associated with internet addiction (OR 1.4, 95% CI 1.09-1.67).

Conclusion: Internet addiction is a relatively frequent phenomenon among medical students. The predictors of internet addiction were male students using it for surfing and entertainment purposes.

KEY WORDS:

Addiction, medical students, Malaysia

INTRODUCTION

The internet has become an essential part of our daily life and it has a high impact on education in particular.^{1,2} It has gained dominance among students, particularly university medical students. One study reported that those who used the internet for 38 hours per week on average, face problems such as lack of sleep and excessive tiredness. Furthermore, this affects their study performance due to poor concentration in class.³ According to Hattie Kauffman, instead of spending their time on real-world social activities, internet users are more prone to spend their leisure time online.⁴ Thus, they will spend less time on social activities and they will experience interpersonal difficulties such as introversion or social phobia.^{5,6} Recent reports from China, Korea, and Taiwan indicated that interactive online gaming has reached addictive proportions.⁷ Internet addicts will lose themselves in anything from online gaming, internet gambling or online pornography.⁶ Studies reported that the prevalence of internet addiction (IA) can range from 10.8% to 16.2% among medical students.^{8,9}

The Internet is commonly used among medical students for literature searches and searching for relevant medical information, as it's inexpensive and also freely accessible for leisurely activities.¹⁰ Thus, the internet appears to be one of the important tools among medical students who experience a stressful life.¹¹ They can release their tension or stress by playing games, watching videos or movies and chatting with their friends on social networking sites. Those medical students who spend their time intensively and inappropriately on the internet are prone to getting addicted to it.¹² To our knowledge, there is a lack of literature on internet usage among medical students in Malaysia. This has encouraged us to determine the predictors of internet addiction among medical students in a public university in Malaysia.

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MATERIALS AND METHODS

Participants

This cross-sectional study was conducted at Universiti Putra Malaysia. The study was conducted from 25th March 2013 to 5th September 2013. After their regular classes, all the respondents were approached with a self-administered questionnaire. Based on the software Epi Info 7, the minimum sample size was 248 with a non-response rate of 30%, giving a minimum sample size of 322. This was based on the power of 80%, α -value of 0.05 with a 95% confidence interval. This study was approved by the Ethical Committee of Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM/TNCPI/RMC/JKEUPM/1.4. 18.1/F1).

Measures

Socio-demographic data and features of internet usage. Socio-demographic data such as age, gender, ethnicity, religion, household income and the features of the internet usage were obtained via a self-administered questionnaire.

Internet Addiction Test

The Internet Addiction Test (IAT) questionnaire was developed by Kimberly Young in 1998 and is the most common tool used in diagnosing IAT.¹ The Malay version has been validated locally amongst 162 medical students. The Malay version of IAT displayed good internal consistency (Cronbach's $\alpha = 0.91$) and parallel reliability (intraclass coefficient = 0.88, $P < 0.001$). An ROC analysis showed that 43 was the optimal cut off score to discriminate students with and without internet addiction.² IAT is a self-completed, 5-point Likert scale with 20 items (1 =rarely to 5 =always) reflecting the frequency of the symptoms. The possible total score of the IAT ranges from 20 to 100. The respondents were classified into 2 categories. The definition of internet addiction is defined when the score test is more or equal to 43 points. Those respondents that scored less than 43 points were classified as non-internet addicts. The severity can be rated as mild, moderate and severe. Mild is defined as when the user is an average on-line user with a score of less than 50 points; moderate is defined as when the user will experience occasional or frequent problems because of the Internet and the score falls between 50-79 points; severe is defined as when the internet usage is causing significant problems in their life and the score is more than 80 points.¹

Depression Anxiety and Stress Scales 21(DASS 21)

DASS 21 is a self-completed, 4-point Likert-type scale with 21 items which is designed to assess the severity of the main symptoms of Depression, Anxiety and Stress.³ Each item has a response scale from 0 to 3. Seven items are used to assess the severity of depression, anxiety and stress level respectively and the scores of identified items for each scale need to be summed up.

Statistical analysis

Statistical analysis was performed using the SPSS package (SPSS 21; SPSS IBM, New York, United States). The continuous data are described as mean and standard deviation (SD) if the distribution is normal or median and interquartile range (IQR) if the data distribution is not normal. Categorical data are reported as proportions (percentage). Chi-square test or Fisher exact tests were used for the categories or dichotomous

predictors. A multivariate logistic regression analysis was used to look for the predictors of IA. All analyses were done with 95% confidence intervals (CI) and the level of significance was set at $p < 0.05$.

RESULTS

A total of 426 respondents were included in the analysis, with a response rate of 69%. Table I shows the percentages of the respondents according to socio-demographic characteristics.

The respondents consisted of 156 male respondents (36.6%) and 270 female respondents (63.4%), with a mean age of 21.60 years (SD 1.50 years). The ethnicity distribution was 237 Malay (55.6%), 148 Chinese (34.7%), 31 Indian (7.3%) and 10 other ethnicity (2.3%). The highest proportion of respondents based on religion was Islam: 243 (57.0%). A majority of the respondents have internet access at home. Two-thirds of the respondents are from an urban area. According to the IAT questionnaire, 157 respondents (36.9%) of the study sample were found to be addicted to the internet. The minimum respondents scored for the IAT questionnaire was 20 whereas the maximum score was 96. The respondents spent a median of four hours per day on the internet. Almost half of the respondents used the internet for entertainment (48.4%) and only 7.3% of the respondents used it for education purposes.

Table II shows the comparison of the clinical characteristics among students with and without internet addiction. About 45% of male respondents and 32% of female respondents were internet addicts, and the difference was statistically significant ($p=0.009$). In addition, there was also a significant association found between duration of internet use and internet addiction ($p<0.001$). Table III shows the predictors of internet addiction. A multiple logistic regression analysis revealed that male gender was the most significant predictor of internet addiction. Students who used the internet for entertainment were 3.5 times more likely to be associated with internet addiction in comparison to education purposes. Male respondents were 1.8 times more likely to develop IA compared to female respondents. Those respondents who spent one hour more per day were 1.05 times more likely to get IA. Other predictors of internet addiction were not statistically significant ($p>0.05$).

DISCUSSION

The prevalence of internet addiction among the medical students was 36.9%. The findings indicate that one out of three among the medical students were affected by problematic internet use. Surprisingly, the prevalence was higher compared to other literature regarding medical students. A study in China and Iran reported that the widespread condition of internet addiction among medical students was 16.2% and 10.8% respectively as stated in Table IV, which is a lower prevalence compared to the current study.^{4,5} The high prevalence could be related to the stress level among the medical students, which is high, as reported in one of the local studies where 18.6% of the university students had moderate and 5.1% had severe or extremely

Table I: The socio-demographic characteristics of the respondents

	Frequency	Percentage (%)
Gender		
Male	156	36.6
Female	270	63.4
Ethnicity		
Malay	237	55.6
Chinese	148	34.7
Indian	31	7.30
Others	10	2.30
Religion		
Islam	243	57.0
Buddhist	130	30.5
Hindu	27	6.30
Christian	26	6.10
Household income, RM	Median 3000.00 (IQR. = 3500.00)	
Internet access at home		
Yes	373	87.6
No	53	12.4
Hometown		
Urban	286	67.1
Rural	140	32.9

Table II: Association between socio-demographic factors and other factors with internet addiction using univariate analysis. (n=426)

	Internet addiction	Non internet addiction	p value
Age, year (mean (SD))	Mean=21.4±1.3	Mean= 21.6±1.5	0.15
Gender n (%)			
Male	70 (44.9)	86 (55.1)	0.01*
Female	87 (32.2)	183 (67.8)	
Ethnicity n (%)			
Malay	88 (37.1)	149 (62.9)	0.58
Chinese	59 (39.9)	89 (60.1)	
Indian	7 (22.6)	24 (77.4)	
Others	3 (30.0)	7 (70.0)	
Household income, RM median (IQR)	Median=3000 (IQR=3500)	Median=3000 (IQR=3500)	0.98
Internet access at home			
Yes	140(37.5)	233(62.5)	0.21
Hometown n (%)			
Urban	45 (32.1)	95 (67.9)	0.16
Rural	112 (39.2)	174 (60.8)	
Duration spend on internet usage per day, hours (median (IQR))	Median= 6.8 (IQR=5.1)	Median= 5.1 (IQR=4.5)	<0.01*
Purpose of internet usage n (%)			
Education	8(25.8)	23(74.2)	0.09
Entertainment	86(41.7)	120(58.3)	
Mixed	63(33.3)	126(66.7)	
Methods of internet access			
Broadband	40(36.7)	69(63.3)	0.89
Wifi	113(36.7)	195(63.3)	
Wifi & broadband	4(44.4)	5(55.6)	
Classification of gadgets for internet usage n (%)			
Non-portable	6(35.3)	11(64.7)	0.97
Portable	144(37.0)	245(63.0)	
Mixed	7(35.0)	13(65.0)	
Place for internet usage n (%)			
Cybercafé	0(0.0)	2(100.0)	0.66
Faculty	33(35.1)	61(64.9)	
Hostel	111(37.1)	188(62.9)	
Faculty & hostel	13(43.0)	17(57.0)	
Faculty & cybercafé	(0.0)	1(100)	
Depression score	8.0	4.8	<0.01*
Anxiety score	9.7	6.9	<0.01*
Stress score	8.8	8.4	<0.01*

*Indicates statistically significant

Table III: Determinants of internet addiction on multiple logistic regression

Variables	OR	95% C.I.	Sig.	
Gender: Female	2.26	1.26	4.06	0.01*
Male				
Activity			0.04	
Entertainment	4.58	1.23	17.13	0.02*
Entertainment and education	2.88	0.75	11.04	0.12
Education				
Daily online in the last 1 week in hours	1.08	1.02	1.14	0.01*
Total severity anxiety score	1.11	1.05	1.17	<0.01*
Total severity depression score	1.05	0.99	1.11	0.10
Total severity stress score	1.01	0.95	1.08	0.68
Age	0.88	0.72	1.07	0.19
Year of study	1.15	0.54	2.46	0.71
Household income	1.00	1.00	1.00	0.95
Home town: Urban	1.39	0.76	2.53	0.29
Rural	1.00			
Presence of internet user at home	2.25	0.88	5.78	0.09
No	1.00			

Table IV: Summary of the prevalence of internet addiction by other studies

Study (n)	Country (%)	Prevalence (%)	Mild (%)	Moderate	Severe
Liu X et al 2010 ⁴ (n=380)	China	16.2	-	-	-
Ghamari, 2011 ⁵ (n=426)	Iran	10.8	-	8	2.8
Pramanik et al 2012 ¹³ (n=130)	Nepal	-	40	42	3
Maryam S et al 2014 ¹⁴ (n=383)	Iran	5.2			

severe stress scores based on the DASS-21 inventory.⁶ The high stress levels will make them prone to going online as a tool to release their tension.^{7,8} The medical students are the most prone to gaining an internet addiction, because internet access is freely available in the hostel and there is no interference from their parents.⁹

Moreover, some of the university students were entitled to a free broadband package. Thus, it is very common for them to get internet access through their laptop or smart phones, which are easily available. The rate of Internet-surfing of males was higher than that of females in our study and this is consistent with the study done in China.⁴ The other significant predictor of internet addiction in this study was duration spend on internet per day (hours). A study of Turkish medical students showed that internet addiction was positively related to depression, anxiety and stress.¹⁰ This could be due to the fact that the students who are addicted to the internet will experience changes in normal sleeping patterns as they may consume coffee to make them alert in order to continue the game.¹¹ Indirectly, their bedtime becomes irregular and shorter. All of this can contribute in the end to them being depressed and suffering from anxiety or stress. Similarly, other studies have also reported that internet addiction demonstrated a significant association with depression.¹² Therefore, the results of our study are consistent with the other studies conducted in other populations.

Strength and limitations

To the best of our knowledge, the current study represents the first study in Malaysia among medical students in relation to internet addiction. The major limitations of this study are

that it was conducted in a single centre and the results may not generalizable to the population.

A multicentre population based study is therefore highly recommended to confirm the association between the internet addiction and the university students.

CONCLUSIONS

The prevalence of internet addiction among medical students in Malaysia was high, as one in every third student was prone to having it. Thus, early awareness is important for the policy maker in order to examine the issue and implement certain measures to prevent it. In view of this emerging problem, a rehabilitation programme may be necessary in the future.

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REFERENCES

1. Young KS. Caught in the net: How to recognise the signs of internet addiction and a winning strategy for recovery : John Wiley & Sons; 1998.
2. Guan NC, Isa SM, Hashim AH, Pillai SK, Harbajan Singh MK. Validity of the Malay Version of the Internet Addiction Test: A Study on a Group of Medical Students in Malaysia. *Asia Pac J Public Health* 2015; 27(2): NP2210-9.
3. Antony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment* 1998; 10(2): 176-81.

4. Liu X, Bao Z, Wang Z. Internet use and Internet addiction disorder among medical students: a case from China. *Asian Social Science* 2010; 6(1): 28-34.
5. Ghamari F, Mohammadbeigi A, Mohammadsalehi N, Hashiani AA. Internet Addiction and Modeling its Risk Factors in Medical Students Iran. *Indian J Psychol Med* 2011; 33(2): 158-62.
6. Shamsuddin K, Fadzil F, Ismail WS, Shah SA, Omar K, Muhammad NA et al. Correlates of depression, anxiety and stress among Malaysian university students. *Asian J Psychiatr* 2013; 6(4): 318-23.
7. Young KS. Internet Addiction: A new clinical phenomenon and its consequences. *American Behavioral Scientist* 2004; 48(4): 402-15.
8. Ceyhan AA. Predictors of problematic internet use on Turkish university students. *Cyberpsychol Behav* 2008; 11(3): 363-6.
9. Frangos C, Frangos C, Kiohos A. Internet Addiction among Greek university students: Demographic associations with the phenomenon, using the Greek version of Young's Internet Addiction. *International Journal of Economic Sciences and Applied Research* 2010; 3(1): 1-35.
10. Akin A, Iskender M. Internet addiction and depression, anxiety and stress. *International online journal of educational sciences* 2011; 3(1): 138-48.
11. Whang LS, Lee S, Chang G. Internet over-users' psychological profiles: a behavior sampling analysis on internet addiction. *Cyberpsychol Behav* 2003; 6(2): 143-50.
12. Cheung LM, Wong WS. The effects of insomnia and internet addiction on depression in Hong Kong Chinese adolescents: an exploratory cross-sectional analysis. *J Sleep Res* 2011; 20(3): 311-7.
13. Pramanik T, Sherpa MT, Shrestha R. Internet addiction in a group of medical students: a cross sectional study. *Nepal Med Coll J* 2012; 14(1): 46-8.
14. Salehi M, Khalili MN, Hojjat SK, Salehi M, Danesh A. Prevalence of internet addiction and associated factors among medical students from Mashhad, Iran in 2013. *Iranian Red Crescent Med J* 2014; 16(5): e17256.