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Original Research Article

Factors affecting internet use among university students in Sarawak, Malaysia: an empirical study

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ABSTRACT

Background: The internet has become an indispensable tool for communication, academic research, information and entertainment. However, heavy users of the internet lead to less confidence in social skills and the tendency to be isolated. The study aimed to assess the pattern of internet use and factors affecting problematic internet use among university students.
Methods: This cross-sectional study conducted among the students of a university in Sarawak, Malaysia. A multistage cluster sampling technique was adapted to select the participants. Data were collected from 463 students by self-administered questionnaire. Hierarchical binary logistic regression analysis was done to determine the potential factors for problematic internet use.
Results: The mean age of the students was 22 years, with a standard deviation of 1.6 years. Two-fifths (61.8%) of the students had no problematic internet use. However, 35.4% had moderate and 2.8% had severe problematic internet use. Hierarchical binary logistic regression analysis found that age of the students, year of study, duration of daily internet use and use of social networking like Skype appeared to be potential predictors of problematic internet use ($p<0.05$).
Conclusions: This study was conducted in only one university, thus did not depict the overall scenarios of the country. The implications of the findings are still worth noting in the process of designing internet addiction studies among university students. Overall, this study has unearthed some useful insights which can serve as a guide to more elaborate studies.

Keywords: Internet use, Malaysia, Sarawak, University students

INTRODUCTION

The internet has changed the way we communicate, live and work. With its remarkable fast data speed, it brings communication across the globe to a new dimension. According to World Internet Use Statistics, 3.58 billion of the world population in 2017 were using the internet.[1] The majority of an internet user is from East and South Asia, where country such as Korea has the fastest internet speed in the world. Internet use in Malaysia increases exponentially throughout the years. Recent data showed that 68.7% of Malaysian are using the internet and spending an average of 2.8 hours on the internet per day. The school-goers were found to spend on an average of 20.9 hours a week on the internet.[2] The numbers of internet users in Malaysia has increased from 70.1% in 2015 to 80.1% in 2017.[3] A recent internet users survey in Malaysia revealed that male's internet users (57.4%)

outnumbered female users (42.6%). A smartphone is the most prevalent medium used to access the internet. The top three activities done by these internet users are communication by texting via over-the-top messaging platforms (96.3%), visiting social networking sites (89.3%) and getting information (86.9%). Facebook is accounted for as the leading platform for social networking sites (SNS). It has been highlighted that three-quarter of the internet users looked for health information online.[2]

The internet or global network with its "information superhighway" capability has a wide range of usage. In general, about two-thirds of internet users used the internet for study purposes. The implementation of enhanced learning and teaching method with internet-based technology in tertiary education in Malaysia make university students inseparable from internet use.[4] Although the internet could be a means of achieving excellent academic performance, nonacademic use of the internet such as internet gaming and social networking may lead to internet addiction.[5-7] Therefore, a growing concern has raised pathological internet use that may lead to various negative psychosocial consequences.[8]

Many terms have been used to a conceptualized maladaptive pattern of Internet use. The first concept of internet addiction was similar to those for substance dependence and withdrawal.[9,10] It was thus proposed that the term "problematic Internet use" was defined as a maladaptive preoccupation with Internet use, experienced as irresistible use for periods longer than intended with significant distress or impairment resulting from the behaviour. As technology advancement usually precede research, DSM-V, considered pathological internet use as an area in need of further research.[11] Worldwide prevalence of problematic internet use among university is currently unavailable due to the absence of large epidemiological study and most research used different diagnostic criteria for problematic internet use.[12] The Internet has become a functional tool for a university student to acquire information and interact with others.[13] Male university students mainly have been using the internet to socialize to their peers more than girls.[14] Various risk factors have been identified predisposing to the pathological internet use including being a male, young age group, time spent online, using social and gaming applications and psychosocial factors such as neuroticism, depression or anxiety.[15] A university student who spends longer times on the internet were associated with poor academic performance due to absence in class.[16]

Meanwhile, excessive internet gaming may lead to negative cognitive function and subsequently predispose to hostile and aggressive behaviour.[17] The advancement of the smartphone made technology at a fingertip, facilitating internet access at any convenient point of time.[18] This contributes to prolonging used of the internet which subsequently will lead to problematic internet use.

At present, there is a limited publication on problematic internet use among university students in Malaysia, particularly in Sarawak. Problematic internet use is considered an emerging mental health issue that requires prompt action before it leads to various negative personal and societal consequences.[19] This study would help in drawing the pattern of internet usage and be able to delineate contributing factors on problematic internet use among university student Sarawak. The result of this study could be used as a reference in formulating future preventive measures on problematic internet use.

METHODS

Participants

A total of 463 students participated in the study. The mean (SD) age of the students was 22.0 (1.6) years. Three-fourths (75.8%) were female, and the rest were male students. Half of the students were Malays (50.8%), 24% were other Bumiputra and another 25.3% were non-bumiputra.

Study design and setting

This cross-sectional study aimed to determine the pattern of internet use and factors associated with it. The study was conducted in one of the public universities in Sarawak, Malaysia. The university had eight faculties. All the faculties were selected. There were 14,033 undergraduates, 1,343 postgraduates and 709 pre-university students in September 2013. The entire undergraduate students in all faculties irrespective of gender were the study population. All the male or female in each course of the faculty were taken as the sample.

Sample size determination and sampling procedure

The undergraduate students were considered as the target study population in this research. In the study, 21% prevalence of problematic internet use was considered as base prevalence which is important in finding out a good estimate of problematic internet use.[20] To estimate the prevalence of internet addiction, the required sample size was 255. Assuming a design effect of 2, the minimum sample size would be 510. The sample size further inflated into 561 using 10% non-response rate. In the first stage, all faculties were selected purposely, in the second stage; year one student was selected randomly. In the selected year, it was assumed that 70-80% of students were present during their class session. Thus, the entire students in selected year present in-class sessions were taken as the sample. A total of 463 students had filled the questionnaire with a response rate of 90.8%.

Data collection instruments and procedure

Data was collected by using a self-administered questionnaire with several sections: Part 1: This part included the socio-demographic characteristics of the

students, which included age, gender, year, faculty, nationality, race, parental education and occupation. Part 2: The questions were about internet access of the students, including frequency, duration, mode of action and devices used, and total money spent on the internet. Part 3: The contents of the questionnaire included the most frequent website visited, purpose and duration of internet usage. Part 4: Consisted of item questions on internet addiction scale adopted from Young.[9] The questionnaire was in English. Before distribution of the questionnaire, the students were briefed about the a) purpose of the study, b) data confidentiality c) voluntary participation and withdrawal from the study. Written informed consent was obtained from the students. A respondent was also given enough time to answer the questionnaire and the questionnaire was collected immediately on completion. The total duration of this study is 11 months starting from August 2015.

Data entry and analysis

Data were checked manually for any inconsistency and completed data was then entered into the computer. After validation checking, simple frequency tables and univariate analysis was done. IBM SPSS version 22.0 was used for data analysis.[21] Finally, hierarchical binary logistic regression analysis was done to determine the potential predictors of problematic internet use. To determine the problematic internet use, 20 items of questions were adapted from Young.[9] Each item of question used Likert's scale having rarely, occasionally, frequently, often and always with one to five score. According to the guideline, all the items were summed up and classified into normal (score 0-49), problematic use (50-79) and severe problem in use (80-90). However, for binary logistic regression analysis, it was dichotomized into no problem and problematic use of the internet.[6]

RESULTS

Purposes and uses of the internet by the students

Table 1 illustrates the purposes of internet use. The use of the internet was categorized into five types such as internet use as educational purposes, use as social networking, for entertainment purposes, social communication and online services. Initially, all the uses were graded on a Likert's scale of never, very rarely, rarely, occasionally, frequently and always. However, for analytic purposes, it was further categorized into a less frequent and frequent user. It was found the 96.8% of the students use the internet for coursework. For social networking, Facebook appeared to have the highest users (87.9%) followed by Instagram (63.9%). About four-fifths (77.3%) of the students use the internet for download movies, music and images followed by download application software (71.3%). For social communication, WhatsApp was widely used (98.7%) followed by e-mail (91.4%), WeChat (65%). However, 69.1% of the students reported that the internet was used for online booking, followed by online banking (49.9%).

Table 1: percentage distribution of students by purposes and uses of the internet (n=463).

Purpose and uses of internet	Less frequent (%)	Frequent user (%)
Internet use as educational purposes		
Coursework	3.2	96.8
Getting general information	8.2	91.8
Academic reading	10.6	89.4
Reading news	27.9	72.1
Internet use as social networking		
Facebook	12.1	87.9
Instagram	36.1	63.9
Twitter	61.3	38.7
Blog	82.3	17.7
Tumblr	85.5	14.5
Stake over flow	98.1	1.9
Internet use as entertainment purpose		
Download movies/ music/images	22.7	77.3
Download application (software)	28.7	71.3
Watch online movies or videos	29.2	70.8
Listen to online music	31.5	68.5
Play online games	64.6	35.4
Webtoon	99.8	0.2
Internet use as social communication		
WhatsApp	1.3	98.7
E-mail	8.6	91.4
WeChat	35.0	65.0
Messenger	35.6	64.4
Telegram	74.1	25.9
Skype	77.1	22.9
Line	77.5	22.5
Viber	87.0	13.0
iMessage	99.4	0.6
Internet use as online services		
Online booking/ticketing	30.9	69.1
Online banking	50.1	49.9
Online shopping	55.9	44.1
Online government service	58.7	41.3
Morpheus (online teaching platform)	98.5	1.5

The pattern of internet use

The median duration of internet use per day was 5 hours. More than half (57.2%) used the internet for more than 5 hours per day. The median frequency of internet use per day was 4 times. However, 82.2% connect internet 4 and more times per day. Data also showed that 70% of the students use the internet for more than 5 years. Very few

students had reported that their family members did not use the internet. The majority (87.5%) of the students' used handphone (Smartphone) for internet use. Only 12.5% use a fixed device for internet connection. Three-fourths (75.6%) use a single device for internet use (Table 2).

Table 2: Percentage distribution of students by the pattern of internet uses (n=463).

Pattern of internet uses	Frequency	Percent
Frequency of internet use daily		
<4	83	17.9
≥4	380	82.1
Duration of internet use per day per day		
<5	198	42.8
≥5	265	57.2
Money spent on internet use per month		
<48	218	47.1
≥48	245	52.9
Years of internet use		
<5	139	30.0
≥5	324	70.0
No. of internet user in the family		
None	25	5.4
1-3	66	14.3
4-6	275	59.4
≥7	97	21.0
Use of internet		
Non-data plan	147	31.7
Data plan	316	68.3
Type of device use		
Mobile	405	87.5
Fixed device	58	12.5
Number of device use		
Multiple devices	113	24.4
Single device	350	75.6
Login status for internet use		
Permanently online	245	52.9
Log on and off	218	47.1

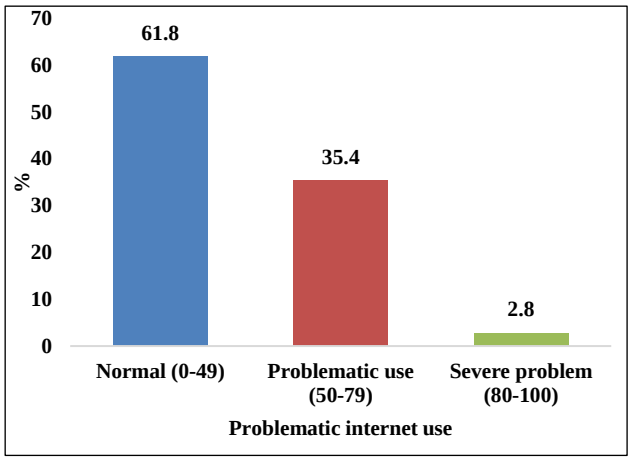

Figure 1: Prevalence of problematic internet use.

Problematic internet use

To assess internet addiction, Kimberly Young 20 items questionnaire was used.[9] The total score of 20 items was further classified into three groups. Figure 1 presents the proportion of problematic internet use among university students. It was found that 61.8% had no problematic internet use. However, 35.8% had mild to a moderate problem in internet use and 2.8% had a severe problem in internet use (Figure 1).

Factors affecting the problematic internet use: hierarchical binary logistic regression analysis

For further analysis, the internet addiction scale was dichotomized into no problem in use of internet having score 0-49 (61.8%) and the score 50 and above considered as problematic use of the internet (38.2%). A hierarchical binary logistic regression analysis was done to determine the factors associated with problematic internet use, in which age and gender entered the first block followed by the year of study, duration of internet use per day and use of social media like Skype. Before fitting the logistic regression model, the independent variables were tested for significance in the bi-variate chi-square test for qualitative variable and independent-sample 't' test for continuous quantitative data (Table 3).

The full model containing all the predictors was statistically significant with model $\chi 2$ (df, n=463)=38.407 (8); p<0.001, indicating that the model could distinguish between respondents who had problematic internet use and those who did not have. The model explained between 8.0% (Cox and Snell R square) and 10.0% (Nagelkerke R squared) of the variance of problematic internet use and was correctly classified in 64.1% of the cases. The goodness of fit indices was not statistically significant (p>0.05), which indicated a well-fitted model with homogeneity and did not violate the assumption. The initial model fitted well with 61.8% correctly classified the outcome variable and the Cox and Snell R Square only 0.02% and Nagelkerke R Square had 0.03%. However, in the hierarchical model, four of the independent variables made a unique contribution to the model (p<0.05) and significantly improved the model. The variables that had a unique contribution into the model were age, year of study, duration of internet use per day and use of social media like Skype.

Analysis revealed that first-year students had 4.454 (95% CI: 1.488, 13.334) times more likely to had problematic internet use, followed by year 3 students, (Adj OR=3.577; 95% CI: 1.420, 9.014) and year 2 students (Adj OR=3.227; 95% CI: 1.158, 8.990) compared to reference category of year 5 students. However, year 4 students had no problematic internet use. Daily engaged in the internet for more than 5 hours had 2.090 (95% CI: 1.392, 3.138) times more likely to be problematic internet users compared to less than 5 hours. Similarly, those who had

used social media like Skype, 2.031 (95% CI: 1.289, 3.201) times likely to be a problematic internet user. However, a one-year increase in age students had 1.262 times likely to be problematic internet use.

Table 3: Factors affecting problematic internet use: hierarchical binary logistic regression analysis.

Variables	β	SE	Adj. OR	95% CI	
				LL	UL
Age	0.233*	0.104	1.262	1.030	1.546
Gender					
Male	0.393	0.239	1.481	0.928	2.364
Female (RC)			1.000		
Year of study					
Year 1	1.494**	0.559	4.454	1.488	13.334
Year 2	1.171*	0.523	3.227	1.158	8.990
Year 3	1.275**	0.471	3.577	1.420	9.014
Year 4	0.417	0.471	1.518	0.603	3.819
Year 5 (RC)			1.000		
Duration of internet use/day					
<5 hours (RC)			1.000		
≥5 hours	0.737***	0.207	2.090	1.392	3.138
Use of Skype					
No (RC)			1.000		
Yes	0.709***	0.232	2.031	1.289	3.201
Constant	-7.395	2.531	0.001		
N	463				
Classification	64.1%				
Model chi square	38.407(8), p<0.001				
Goodness of fit	7.215 (8), p=0.514				
Cox and Snell R Square	0.080				
Nagelkerke R Square	0.108				

*p<0.05, **p<0.01; *p<0.001, RC=Reference category, Dependent variable=Problematic internet use (Yes versus No), SE=Standard error, LL=Lower limit, UL=Upper limit

DISCUSSION

In this study, 2.8% of the students have a severe problem in internet use while 35.4% having a moderate problem making up 38.2% having problematic internet users. This rate is relatively higher compared to the study finding conducted among university student in another university in Malaysia which was in 32%.[22] In another study among undergraduate students in Nigeria, 30% of the study sample were found to have problematic internet use.[23] It must be noted that comparing these studies is difficult because of differences in social and cultural contexts.

This study also highlighted the factors contributing to problematic internet addiction. As the mean age of the study sample was 22 years, it is expected that young internet users are at higher risk of becoming an internet addict than older users. The reason being due to the availability of student's free time and as a way of getting away from university routines. Being in the first year of study is another factor found contributing to problematic internet use. This might be due to lack of parental supervision traded by strong peer-influenced.[24] It is well known that the duration of internet use per day contributes to problematic internet use. This study showed that students who use the internet more than five hours per day are more likely to have problematic internet use. This finding is consistent with previous studies.[25-28] It was found that the use of social media like skype contributes to increased risk of problematic internet use. Communication pleasure exerted by social media has been indicated as a strong predictor for problematic internet use.[25]

Although there were several significant findings in this study, it has several limitations. Firstly, the self-administered questionnaire used in this study may lead to under-reporting of the actual internet usage by the respondents. Secondly, this study was conducted in only one university, thus did not depict the overall scenarios of other universities in the country. Thirdly, that this study is a cross-sectional study, thus causality of the relationship was not established.

CONCLUSION

Overall, the present study integrated various factors concerning the usage of Internet applications to determine

the factors which may lead to pathological internet use. The high rate of problematic internet users in this study needs to be taken seriously. Therefore, the university or government may put up a regulatory body to curb this psychosocial issue. There should be a comprehensive plan for prevention and to resolve the internet addiction by setting up more institution counsellors, an expert in handling internet addiction issue. To have a clear problematic internet use among university students in the country, multi-university collaboration should be in place to conduct multicenter research involving large sample size to delineate the issue. This is particularly important as pathological internet use may lead to poor academic performance among students.

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