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Pathological Internet Use and Psychosocial Risk Factors among ASEAN University Students

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Abstract

Background: Pathological internet use may lead to serious psychosocial problems and dysfunction.
Objectives: The purpose of the study was to investigate the prevalence of pathological internet use among undergraduate university students in five ASEAN countries in relation to sociodemographics, internet use variables, psychosocial factors, and comorbid symptoms.
Methods: In a cross-sectional survey in 2015 in Indonesia (Yogyakarta), Malaysia (Kuala Lumpur), Myanmar (Yangon), Thailand (MahaSarakham), and Vietnam (Hanoi), 3240 undergraduate university students (Mean age = 20.5 years, SD = 1.6), who were randomly selected, responded to a questionnaire including the "Young Diagnostic Questionnaire for Internet Addiction" (YDQ) and other measures.
Results: Overall, the prevalences of pathological internet use were 35.9% (ranging from 16.1% in Myanmar to 52.4% in Thailand), maladaptive use 34.8% and adjusted Internet users 29.9%. In multivariate logistic regression analysis, internet use variables (heavy overall Internet use, heavy Internet use for recreational purposes, and heavy smartphone use), psychosocial factors (the experience of childhood physical abuse, childhood sexual abuse, lack of social support, and poor academic performance), and comorbid symptoms (having a self-classified gambling problem, hazardous or harmful alcohol use, past 12-month drug use, severe depression, sleeping problems, having attempted a suicide, and PTSD symptoms) were found to be associated with pathological internet use.
Conclusions: The study found a very high prevalence of pathological internet use; those students lacking psychosocial support and having comorbid symptoms were at the highest risk.

Keywords: Asia, Comorbidity, Internet, Psychosocial Factors, Students

1. Background

Internet use has been rapidly increasing worldwide and plays an important role in our lives (1). It is a tool for educational, recreational, social, and commercial purposes. However, inappropriate use of the internet can cause serious problems (1). Internet addiction or overuse can be problematic and pose negative consequences on one's mental health and quality of life (1). It has been shown that internet addiction has been linked to depression, aggressive feelings, cognitions, and behaviours (1). As reviewed by Kuss et al. (1), factors associated with internet addiction may include sociodemographic variables, such as male gender and being of Asian ethnicity, internet use variables, such as increased time spend online, psychosocial factors, such as low life satisfaction, lack of social support and history of child abuse, and comorbid symptoms, such as depression, harmful alcohol use and sleeping disorders. High school or college students are more vulnerable to internet addiction as compared with other segments of the society (1).

Internet addiction may be more prevalent in Asian countries than in other parts of the world (2). Among medical students in Malaysia, 46.9% were at-risk of smartphone addiction (3) and 20.5% were found to be pathological internet users (4); among university students, one-third had

moderate internet addiction (5); and 31% were mild addicts, 63% moderate addicts, and 3% severe internet addicts (6).

There is a lack of studies on problematic internet use among university students in Association of Southeast Asian Nations (ASEAN).

2. Objectives

The paper thought to examine the prevalence of internet use among undergraduate university students in five ASEAN countries (Indonesia, Malaysia, Myanmar, Thailand, and Vietnam) in relation to sociodemographics, internet use variables, psychosocial and comorbid factors.

3. Materials and Methods

3.1. Study Design and Settings

In a cross-sectional survey, a questionnaire on a range of health behaviours was self-administered in a classroom setting among university students in five ASEAN countries in 2015.

3.2. Participants

In all, 3240 undergraduate university students (mean age = 20.5 years, SD = 1.6) across five ASEAN countries agreed to participate, ranging from 231 in Indonesia to 1023 in Malaysia.

3.3. Questionnaires

The "Young Diagnostic Questionnaire for Internet Addiction" (YDQ) was used to assess pathological internet use, with a total score of 5 or more being 'pathological users' (7). (Cronbach alpha 0.70)

Internet use variables included the time used on the internet overall, for study purposes, for recreational purposes, smartphone use, and the use of the internet for pornography.

Sociodemographic variables included age, gender, country, and subjective socioeconomic family background.

3.4. Psychosocial Factors

The WHO adverse childhood experiences scale was used to assess child abuse experiences (8). Social support was assessed with three questions from the social support questionnaire (9) (Cronbach's alpha 0.65): Life satisfaction with one question. Self-rated academic performance. Skipping breakfast.

3.5. Comorbid Symptoms

Self-classified gambling problem. Current tobacco use (10). Hazardous or harmful alcohol use as measured by the "Alcohol Use Disorder Identification Test (AUDIT)-C" (11). (Cronbach alpha 0.70). Illicit drug use with one item. Depressive symptoms, with scores 15 or more on the "Centre for Epidemiologic Studies Depression Scale (CES-D: 10 item)" (12). (Cronbach alpha 0.69). Post-traumatic stress disorder (PTSD) symptoms, with scores of 4 or more on Breslau's 7-item screening questionnaire (13). (Cronbach alpha 0.78).

Self-rated sleeping problems defined by the response to this question with 'moderately', 'severe' or 'extreme/cannot do'. Suicidal behaviour (Having ever had a suicide attempt).

3.6. Ethical Considerations

Ethics approvals were obtained from all participating institutions. Informed consent was obtained from all participating students.

3.7. Data Analyses

The data were analysed using IBM SPSS (version 22.0). The proportion of sociodemographic factors, internet use variables, psychosocial factors, and comorbid symptoms was calculated as percentage or means and standard deviations. Pearson Chi-square was utilized to calculate differences in proportions. Logistic regression analyses were performed to calculate the crude odds ratio (OR) with 95% confidence interval (CI) in order to estimate the associations between the potential determinants and pathological internet use. All study variables that were statistically significant ($P < 0.05$) in bivariate analyses were used in the final multivariable model. Potential multi-collinearity between variables was assessed with variance inflation factors, none of which exceeded a critical value.

3.8. Study Procedure

In each participating country, undergraduate students were surveyed in their language in classrooms (inclusion criteria: all students present in the class) selected through a stratified random sampling procedure. Participation rates were in all countries more than 90%, except for Indonesia 69% and Myanmar 73%.

4. Results

Almost two-thirds of the sample (62.8%) were women and 67.1% came from a less wealthy family. Over half (53.9%) of the students reported an overall internet use of 5 hours or more per day, 34.7% used the internet for study purposes

3 or more hours a day, 55.2% used it for recreational purposes 3 or more hours a day, 57.6% used the smartphone for more hours daily, and 23.3% had used the internet in the past week for pornography. Overall, the prevalence of pathological internet use was 35.9%, maladaptive use 34.8%, and adjusted internet use 29.9%. There were country variations in pathological internet use among university students, ranging from 16.1% in Myanmar to 52.4% in Thailand (Table 1)

Table 2 describes the item responses to the YDQ.

Table 2. Responses to the YDQ

Items	All, %	Men, %	Women, %	Chi-Square P Value
1) Do you feel preoccupied with the internet and/or smartphone (think about a previous online activity or anticipate the next online session)?	70.0	67.0	71.8	00.004
2) Do you feel the need to use the internet and/or smartphone with increasing amounts of time in order to achieve satisfaction?	59.0	54.6	61.7	< 0.001
3) Have you repeatedly made unsuccessful efforts to control, cut back, or stop internet and/or smartphone use?	45.0	42.9	46.3	00.062
4) Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop internet and/or smartphone use?	29.4	29.2	29.5	00.837
5) Do you stay online longer than originally intended?	69.0	68.4	69.4	00.525
6) Have you jeopardized or risked the loss of a significant relationship, job, educational or career opportunity because of the internet and/or smartphone?	26.4	24.1	27.8	00.020
7) Have you lied to family members, therapist, or others to conceal the extent of involvement with the internet and/or smartphone?	20.5	24.8	17.9	<0.001
8) Do you use the internet and/or smartphone as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?	54.0	50.7	55.9	00.005

4.1. Associations with Pathological Internet Use

In multivariate logistic regression analysis, internet use variables (heavy overall internet use, heavy internet use for recreational purposes and heavy smart phone use), psychosocial factors (the experience of childhood physical abuse, childhood sexual abuse, lack of social support, and poor academic performance), and comorbid symptoms (having a self-classified gambling problem, hazardous or harmful alcohol use, drug use in the past 12 months, moderate or severe depression, sleeping problems, having attempted a suicide and PTSD symptoms) were found to be associated with pathological internet use (see Table 3).

5. Discussion

This survey reveals that overall internet use by students was heavy (53.9% $\geq$ 5 hours/day). They had also heavy internet use for recreational purposes (55.2% $\geq$ 3 hours/day), and heavy smartphone use (57.6% $\geq$ 4 hours/day). Similar rates of heavy internet use have been reported in a study among university students in Thailand (35.3% $\geq$ 6 hours/day) (14). The overall prevalence of pathological internet use was 35.9% across five ASEAN countries, which seems to be similar to the findings of previous studies among university students in Malaysia (3-6), but higher than in some other studies among university students in the region, e.g., 21.3% in China (15). Among the five study countries, the highest prevalence of pathological internet use was found in Thailand (45.9%). This finding seems to echo a high prevalence of Facebook addiction (41.8%) among adolescent high school students from urban centres in Thailand (16).

The study found in agreement with previous studies (1) that increased time spent on the internet such as overall internet use, recreational internet, and smartphone use was associated with pathological internet use. Unlike some studies (17) that found a preponderance of men in pathological internet use, this study did not find any gender difference. Further, the study found, in line with other studies (1), that psychosocial factors (having experienced childhood emotional and sexual abuse, lack of social support and poor academic performance) were associated with pathological internet use. The association between physical child abuse and pathological internet use found in this study was also found among Chinese students (18). While this study did not find an association between emotional child abuse and pathological internet use, another study did (19). In agreement with the present survey, a previous study among European adolescents also found lacking social support increased the risk of pathological internet use (20). It is possible that the increased pursuit of internet use tries to compensate for social support (21). Our study found also that better rating of academic performance was inversely related to pathological internet use, as found in previous studies (1).

The study found, in agreement with previous studies (1, 22), that comorbid symptoms (having a gambling problem, alcohol and drug use, and mental distress such as depression, PTSD symptoms, sleeping problems and suicide attempt) were associated with pathological internet use. It is possible that mentally distressed university students may use the internet as a way of coping mechanism with their mental distress (22). Comorbid symptoms such as substance use and mental distress may "result in, contribute to, or exacerbate the symptoms of internet addiction" and on the other hand pathological internet use "may lead to, contribute to, or exacerbate the symptoms of various mental disorders" (2). Problems with a regulated sleep pattern may have detrimental effects

Table 3. Predictors of Pathological Internet Use

Variable	UOR (95% CI)	P Value	AOR (95% CI)[a]	P Value
Sociodemographics				
Sex				
Female	1 (Reference)		-	
Male	0.94 (0.81 - 1.09)	00.098		
Age in years				
18 - 19	1 (Reference)		1 (Reference)	
20 - 21	0.70 (0.59-0.84)	< 0.001	0.86 (0.71-1.06)	00.256
22 - 28	0.88 (0.73 - 1.07)	00.277	0.93 (0.74 - 1.16)	00.298
Subjective economic status				
Poorer	1 (Reference)		-	
Wealthier	0.96 (0.83 - 1.12)	00.098		
Internet use variables				
Overall internet use ($\geq$ 5 hours/day)	1.92 (1.66 - 2.23)	< 0.001	1.43 (1.17 - 1.74)	< 0.001
Internet use (study purposes) ($\geq$ 3 hours/day)	1.16 (0.99 - 1.35)	0.051	-	
Internet use (recreational purposes) ($\geq$ 3 hours/day	1.73 (1.49 - 2.01)	< 0.001	1.35 (1.11 - 1.64)	00.005
Internet pornography (past week)	1.18 (0.99 - 1.41)	0.052	-	
Smart phone use ($\geq$ 4 hours/day)	1.39 (1.20 - 1.61)	< 0.001	1.39 (1.16 - 1.66)	< 0.001
Psychosocial factors				
Childhood emotional abuse	1.09 (0.94 - 1.26)	00.087	-	
Childhood physical abuse	1.68 (1.46 - 1.95)	< 0.001	1.48 (1.24 - 1.77)	< 0.001
Childhood sexual abuse	1.93 (1.63 - 2.28)	< 0.001	1.28 (1.06 - 1.56)	00.099
Social support	0.85 (0.81 - 0.89)	< 0.001	0.91 (0.86 - 0.96)	< 0.001
Life satisfaction				
Low	(1 (Reference)		1 (Reference)	00.133
Moderate	0.69 (0.58 - 0.83)	<0.001	0.88 (0.71 - 1.09)	00.112
High	0.77 (0.62 - 0.96)*	0.044	0.92 (0.70 - 1.21)	
Academic performance				
Poor	1 (Reference)		1 (Reference)	
Satisfactory	0.78 (0.64 - 0.96)*	00.034	0.77 (0.61 - 0.97)*	00.038
Good/excellent	0.71 (0.59 - 0.86)	< 0.001	0.68 (0.53 - 0.86)**	00.008
Skipping breakfast	2.07 (1.79 - 2.39)	< 0.001	1.14 (0.96 - 1.35)	00.098
Comorbid symptoms				
Having gambling problem	2.51 (1.99 - 3.18)	< 0.001	1.73 (1.31 - 2.26)	< 0.001
Current tobacco use	1.62 (1.10 - 2.38)*	00.046	1.13 (0.73 - 1.77)	00.211
Hazardous or harmful alcohol use	2.03 (1.68 - 2.46)	< 0.001	1.35 (1.07 - 1.71)*	00.036
Drug use (past 12 months)	1.45 (1.12 - 1.88)**	00.004	1.66 (1.23 - 2.25)**	00.006
Depression (severe)	2.57 (2.05 - 3.22)	< 0.001	1.82 (1.53 - 2.17)	< 0.001
Sleeping problem (moderate/severe)	1.39 (1.19 - 1.63)	< 0.001	1.27 (1.06 - 1.52)**	00.005
Suicide attempt (ever)	2.17 (1.42 - 3.33)	< 0.001	1.66 (1.12 - 2.05)**	00.004
PTSD symptoms (4 or more)	2.53 (2.15 - 2.98)	< 0.001	1.70 (1.41 - 2.06)	< 0.001

Abbreviations: AOR, adjusted odds ratio; CI, Confidence Interval; UOR, unadjusted odds ratio.
[a] Hosmer and Lemeshow Chi-square = 28.17; P $\leq$ 0.000.

on daytime functioning and academic achievement (23). More research is needed to examine the pathway of the described relationships (24). Considering that addiction is a progressive and chronic condition, identifying the development or the early stages of pathological internet use may provide the possibility to intervene before these behaviours become a fully developed psychopathological disorder, suicidal behaviour, or addiction (24). It is suggested that mental health and substance issues are incorporated in problematic internet use prevention programmes targeting university student populations in ASEAN.

As study limitations, the measurement of pathological

internet use and other measures were only based on self-report. The study was cross-sectional; thus, no causal conclusions can be drawn, and the study was not representative.

5.1. Conclusions

The study found a very high prevalence of pathological Internet use and those students lacking psychosocial support and having comorbid symptoms are at highest risk of pathological Internet use.

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Footnotes

Authors' Contribution: Niruwan Turnbull, Karl Peltzer and Supa Pengpid conceived and designed the study. Niruwan Turnbull and Karl Peltzer performed the data analysis and interpretation. Niruwan Turnbull and Karl Peltzer drafted the manuscript. Niruwan Turnbull, Karl Peltzer, Supa Pengpid, Wah Yun Low,Thang Nguyen Huu, Erna Rochmawati and Hla Hla Win revised it critically for important intellectual content.

Declaration of Interests: The authors declare they have no conflicts of interest.

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Table 1. Sample Characteristics[a]

Variable	Sample	Internet Use		
		Adaptive Users	Maladaptive Users	Pathological Users
	N (%) or M (SD)	N (%) or M (SD)	N (%) or M (SD)	N (%) or M (SD)
Sociodemographics				
All	3240	947 (29.9)	1127 (34.8)	161 (35.9)
Country	0			
Indonesia	231 (7.1)	58 (25.1)	84 (36.4)	89 (38.5)
Malaysia	1023 (31.6)	372 (36.4)	355 (3.7)	296 (28.9)
Myanmar	386 (11.9)	177 (45.9)	147 (38.1)	62 (16.1)
Thailand	783 (24.2)	138 (17.7)	232 (29.8)	408 (52.4)
Vietnam	817 (25.2)	202 (24.7)	309 (37.8)	306 (37.5)
Sex				
Female	2031 (62.8)	554 (27.3)	732 (36.1)	740 (36.5)
Male	1204 (37.2)	390 (32.4)	394 (32.7)	420 (34.9)
Age in years				
18 - 19	896 (27.7)	218 (24.5)	314 (35.2)	359 (40.3)
20 - 21	1482 (45.8)	474 (32.0)	527 (35.6)	481 (32.5)
22 - 28	856 (26.5)	254 (29.7)	283 (33.1)	319 (37.3)
Subjective economic status				
Poorer	2160 (67.1)	595 (27.6)	755 (35.0)	807 (37.4)
Wealthier	1061 (32.9)	346 (32.7)	367 (34.7)	346 (32.7)
Internet use variables				
Overall internet use ($\geq$ 5 hours/day)	1719 (53.9)	419 (24.4)	562 (32.7)	737 (42.9)
Internet use (study purposes) ($\geq$ 3 hours/day)	1091 (34.7)	342 (31.4)	329 (30.2)	419 (38.4)
Internet use (recreational purposes) ($\geq$3 hours/day	1748 (55.2)	417 (23.9)	593 (34.0)	733 (42.1)
Internet pornography (past week)	692 (23.3)	160 (23.2)	249 (36.0)	282 (40.8)
Smart phone use ($\geq$ 4 hours/day)	1841 (57.6)	497 (27.0)	621 (33.7)	723 (39.3)
Psychosocial factors				
Childhood emotional abuse	1957 (60.4)	512 (26.2)	693 (35.5)	749 (38.3)
Childhood physical abuse	1258 (38.8)	314 (25.0)	432 (34.3)	512 (40.7)
Childhood sexual abuse	724 (22.4)	124 (17.1)	272 (37.6)	328 (45.3)
Social support (range 3 - 12) M (SD)	8.7 (1.5)	8.8 (1.4)	8.7 (1.6)	8.4 (1.4)
Life satisfaction				
Low	663 (20.5)	154(23.2)	229 (34.5)	280 (42.2)
Moderate	1883 (58.2)	560 (29.8)	689 (36.6)	631 (33.6)
High	692 (21.4)	232 (33.6)	209 (30.3)	249 (36.1)
Academic performance				
Poor	633 (19.6)	145 (22.9)	224 (35.4)	264 (41.7)
Satisfactory	1084 (33.5)	315 (29.1)	380 (35.1)	388 (35.8)
Good/excellent	1514 (46.9)	484 (32.1)	521 (34.5)	505 (33.4)

Skipping breakfast	1795 (55.5)	447 (24.9)	610 (34.0)	735 (41.0)
Comorbid symptoms				
Having a gambling problem	310 (10.0)	55 (18.0)	77 (25.2)	173 (56.7)
Current tobacco use	107 (3.3)	30 (28.0)	29 (27.1)	48 (44.9)
Hazardous or harmful alcohol use	513 (15.9)	95 (18.6)	156 (30.5)	261 (51.0)
Drug use (past 12 months)	255 (8.2)	65 (25.5)	84 (32.9)	106 (41.6)
Depression (severe)	348 (10.5)	50 (5.1)	103 (8.9)	195 (16.6)
Sleeping problem (moderate/severe)	924 (28.6)	206 (22.3)	336 (36.4)	381 (41.3)
Suicide attempt (ever)	87 (2.7)	21 (2.2)	19 (1.7)	47 (4.0)
PTSD symptoms (4 or more)	792 (24.4)	138 (17.4)	258 (32.6)	395 (49.9)

[a]Values are expressed as No. (%) or M (SD).