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Internet Addiction among University Students and its Associated Factors: A Cross-Sectional Study among College Students in Hanoi, Vietnam

Nguyen Thi Mai Lan[1*], Lee Kyesun[2], Vu Dung[3], Nguyen Thi Thanh Huyen[4], Huynh Van Chan[5], Nguyen Thi Quy[6], Tran Thu Huong[7], Nguyen Thi Hoa Mai[8], Vu Thu Trang[9], Nguyen Van Hieu[10]

[1]Graduate Academy of Social Sciences, 477 Nguyen Trai street, Thanh Xuan district, Hanoi, Vietnam
[2] Thang Long University, Nghiem Xuan Yem, Dai Kim, Hoang Mai district, Hanoi, Vietnam
[3]Institute of Psychology, 37 Kim Ma Thuong Street, Ba Đình district, Hanoi, Vietnam
[4] Vietnam Institute of Psychological Training and Application (VIPTA)
[5]University of Social Sciences and Humanities, Vietnam National University, Ho Chi Minh City, 10-12 Dinh Tien Hoang street, Ben Nghe ward, District 1, Ho Chi Minh, Vietnam
[6]People's Police University, 36 Nguyen Huu Tho street, Tan Phong ward, District 7, Ho Chí Minh, Vietnam
[7] University of Social Sciences and Humanities, Vietnam National University, 336 Nguyen Trai street, Thanh Xuan district, Hanoi, Vietnam
[8] Institute of Human Studies, 9A Kim Ma Thuong, Ba Dinh, Hanoi, Vietnam
[9] Graduate Academy of Social Sciences, 477 Nguyen Trai street, Thanh Xuan district, Hanoi, Vietnam
[10]Hanoi National University of Education, 136 Xuan Thuy street, Cau Giay district, Hanoi, Vietnam

[*]**Corresponding author***:* Nguyen Thi Mai Lan
Graduate Academy of Social Sciences, Vietnam Academy of Social Sciences
Address: 477, Nguyen Trai, Thanh Xuan, Hanoi, Vietnam.
Email: mailantamly@gmail.com

ABSTRACT

Internet addiction leaves serious negative impacts on students' physical and mental health. This study examined the prevalence of Internet addiction among college students in Hanoi, Vietnam and the relationship between Internet addiction and its related factors. 25.5% of the students in this study fitted the criteria of Internet addiction. Factors that correlated with Internet addiction included Internet usage, academic performance, loneliness, and stress. Internet addiction was not affected by gender, family situation, self-esteem, life satisfaction, depression, and anxiety. Prevention and intervention measures should be implemented inside and outside of universities to raise students' awareness of Internet addiction.

Keywords: Internet usage; Internet addiction; predictor; university student; Hanoi; Vietnam.

Correspondence:
Nguyen Thi Mai Lan
Graduate Academy of Social Sciences, Vietnam Academy of Social Sciences
Address: 477, Nguyen Trai, Thanh Xuan, Hanoi, Vietnam.
Email: mailantamly@gmail.com

INTRODUCTION

The internet has become an inevitable part of modern life. The Internet is a pivotal and effective tool for education, entertainment, communication, data gathering, and knowledge sharing (Kima *et al.*, 2006, Kraut *et al.*, 1998; Morahan-Martin, 1999). In 1991, 22.4% of the South Korean population had access to the Internet, but by June 2002, this figure had more than doubled to 58%, or 25.65 million users (Korea Network Information Center,2002). Similarly, the rate of Internet access in the United States also increased significantly, from 26.2% in December 1998 to more than 50% in September 2001 (NTIA and ESA, 2002). Unfortunately, Internet overuse also becomes more common; and this has been recognized as a global problem. In Asia, the rate of Internet addiction in Taiwanis17.55% and in Korea is 11.50% (Hechanovaand Czincz, 2008).

Internet addiction refers to the excessive, uncontrollable use of the Internet, which can lead to functional impairment in daily life (Young, 1999). Internet addiction is identified as an impulse-control disorder, characterized bycompulsiveusage (Goldberg, 1996).Block (2008) pointed out 4 symptoms of Internet addiction: (1) excessive Internet use, accompanied byloss of the sense of time or neglect of daily tasks; (2) withdrawal, feeling angry, stressed and/or depressed whenlacking Internet access; (3) tolerance, a marked increase in Internet usage time to obtain satisfaction; and a demand for good computer equipment; and (4) dysfunction, including dispute, lying, poor academic or work performance, social isolation, and fatigue (Block, 2008). While Internet addicts acknowledge the harmful consequences of Internet overuse to their personal lives, they insist on spending more time on the Internet and seeking pleasure from using the Internet.

College students arethe social group at the highest risk for Internet addiction (Moore, 1995; Kima *et al.*,2006; Hall and Parsons, 2001). The Internet is considered a part of college student culture, and students are encouraged to use the Internet owing to free Internet access without limit, little parental control, high flexibility in personal time management (Kima *et al*, 2006). The Intern*et al*so helps students escape academic stress and social isolation (Young, 2003).

Students who rely on many functions of the Internet and students who have used the Internet for more than 5 years are more likely to be addicted to the Internet (Patel, 2019). On average, addicts spend an additional 1.08 days per week and an additional 0.64 hours per session on the Internet compared to non-addicts (Chak and Leung, 2004). Loneliness, self-esteem and life satisfaction explain 38% of the total variance in Internet addiction (Bozoglan, Demirer and Sahin, 2013). There is a strong relationship between depression, anxiety, stress and Internet addiction (Akin and Iskende, 2011). Students who are addicted to the Internet spend much more time on the Internet than on studying. Another factor is the

gender difference. The prevalence of Internet addiction is higher among male students than female students (Gashti and Pilevari, 2012; Azher *et al*, 2014). However, some studies failed to find gender differences in Internet addiction (Bozoglan, Dmirer and Sahin, 2013).

Previous studies have found that Internet addiction can cause a variety of problems for university students, such as loneliness(Ayaroglu, 2002; Caplan, 2002; Ceyhan, 2007; Eldeklioglu, 2008; Kim and Davis, 2009; Kurtara, 2008; Erdogan, 2008), reduced quality of life,academic failure, stress, depression, andlow self-esteem(Bulut-Serin, 2011; Chou and Hsiao, 2000; Ferraro *et al*., 2007; Hardie and Tee, 2007; Kim and Davis, 2009; Kima *et al*, 2006; Kimand Davis, 2009; Ko *et al*, 2011; Leung and Lee, 2005; Morahan-Martin and Schumacker, 2000; Sobell, 2007; Yang & Tung, 2007).

Following international trends, the rate of internet usage in Vietnam is also increasing. A recent national survey of teenagers and young adults showed that 50% of teenagers in urban areas and 13% of teenagers in rural areas used the Internet (MOH, WHO and UNICEF, 2005).For Vietnamese youth, the Internet provided a platform for comfortable and free expression (Ngo, Ross and Ratliff, 2008). However, there has been little research on Internet usage and addiction among college students as well as factors influencing Internet addiction in students, such as loneliness, self-esteem, life satisfaction, anxiety, depression as well as gender, academic performance, and Internet usage. Therefore, this research results will provide an important scientific basis for educational managers and psychologists to develop effective and suitable Internet prevention and intervention programs for Vietnamese students.

METHODS

Study design

This was a cross-sectional study.

Sample

431 students from 3 universities in Hanoi, Vietnam participated in this study. The 3 universitieswere randomly selected out of 87 educational institutes in Hanoi. In each university, we selected randomly 150 students. A total of 450 questionnaires was given out, 431 responses were collected back. The response rate was 95.78%.

Measurements

Internet addiction: Internet addiction was measured by Young's Internet Addiction Test (IAT; Young, 1998). The scale consists of 20 items rated ona 6-point Likert scale, from 0 (rarely) to 5 (always). The IAT is the most common tool for assessing internet addiction, but the cut-off point for internet addiction varies across studies (Ko *et al*., 2005). In this study, we applied the cut-off score at 70, similar to studies conducted in Asian settings (Jang, Hwang and Choi,2008; Kim *et al*, 2006; Park, Kim and Cho, 2008). The reliability coefficient of the scale in this study was high: Cronbach's alpha = 0.84.

Loneliness: Weused theUCLA Loneliness ScaleVersion 3(Russell, Peplau and Ferguson, 1978), which contains 20 items measuring how often one person feels disconnected from others. Items included "How often do you feel left out?" and "How often do you feel part of a group of friends?".In this study, the reliability coefficient of the scale was 0.85.

Self-esteem: Self-esteem was measured by the Rosenberg Self-esteem Scale (Rosenberg, 1965). The scale consists of 10 items rated on a scale from 1 (strongly agree) to 4 (strongly disagree). High scores indicate low self-esteem. The scale was reliable: Cronbach's alpha = 0.86.

Life satisfaction: Life satisfaction was measured by the Satisfaction with Life Scale (Diener *et al*, 1985). Participants rated 5 items on a scale of 1 (strongly disagree) to 7 (strongly agree). The score can range from 7 to 35. In this study, the reliability coefficient of the scale was 0.88

Mental health: Students' mental health was assessed by the Depression Anxiety Stress Scales (DASS, Lovibond and Lovibond, 2004). The full DASS scale was used, with 14-item for each subscale measuringdepression, anxiety, and stress. The rating was provided on a 4-point Likert scale. In this study, we analyzed depression, anxiety and stress scores separately.

Internet usage was measured by hours of Internet usage per day. Year of the study was defined as the first year, the second year, third year and fourth year of college. Academic performance was measured by students' self-report of excellent, good or average performance. For family background, respondents reported either they had both parents and had a single parents.

Data collection

Data were collected in person with the assistance of universitystaff.Any concern of participants during the survey was answeredto ensure the objectivity of the data.

Data analysis and statistical method

Proportions for categorical variables and means with standard deviations for continuous variables were used to summarize the data. To detect the differences among those with and without internet addiction, we used the Chi-squared tests for categorical variables and the independent t-test tests for continuous variables. The multivariate logistic regression model was carried out toidentify factors related to internet addiction among college students surveyed. The significance level of $p < 0.05$ was used. All analyses were conducted using Stata version 16 (Stata Corp, College Station, TX).

Ethical considerations

Ethical consentwas taken from the Ethics Committee of Vietnamese Association of Psychology. Participants in this study were voluntary and fully informed of the research objectives.

RESULTS

The characteristics of the study participantsare summarized in Table 1. The majority of the participants were female (74.9%), sophomore (52.4%), had good academic performance (70.1%), and lived with their parents (89.6%). In terms of mental health, most students reported low self-esteem (72.2%), 36.4% and 20.9% of participants reported satisfaction and extreme satisfaction with life, respectively. The proportion of students having a symptom of depression, anxiety, and stress were 39.2%, 43.9%, and 36.4%, respectively. The mean loneliness score of students was 23.8 (SD = 11.7) and the mean daily time for using the internet was 6.4 hours (SD = 3.5).

Table 1: Participants' characteristics

Characteristics	N (%)
Sex	
Male	108 (25.1)
Female	323 (74.9)
Grade	
Freshman	19 (4.4)
2nd year	226 (52.4)
3rd year	142 (32.9)
4th year	44 (10.2)
Academic performance	
Excellent	95 (22.0)
Good	302 (70.1)
Average	34 (7.9)
Living with	
Both parents	386 (89.6)
Other	45 (10.4)
Low self-esteem score	
No	120 (27.8)
Yes	311 (72.2)
Satisfaction scale	
Extreme dissatisfaction	45 (10.4)
Little satisfaction	91 (21.1)
Neutral	48 (11.1)
Satisfaction	157 (36.4)
Extreme satisfaction	90 (20.9)
Symptom of depression	
No	262 (60.8)
Yes	169 (39.2)
Symptom of anxiety	
No	242 (56.1)
Yes	189 (43.9)
Symptom of stress	
No	274 (63.6)
Yes	157 (36.4)
Daily time for using internet (hour)- Mean (SD)	6.4 (3.5)
Loneliness score - Mean (SD)	23.8 (11.7)

Table 2 illustrates the distribution of students' characteristics by internet addiction.Overall, 25.5% of the participants were classified as internet addiction. There was no statistically significant difference in the proportion of internet addiction by gender, living situation, self-esteem and life satisfaction.

Table 2: Internet addiction proportion across different characteristics

Characteristics	Internet addiction		P value
	No	Yes	
All	322 (74.7)	109 (25.3)	
Sex			0.492
Male	78 (72.2)	30 (27.8)	
Female	244 (75.5)	79 (24.5)	
Grade			
Freshman	14 (73.7)	5 (26.3)	**0.005**
2nd year	154 (68.1)	72 (31.9)	
3rd year	115 (81.0)	27 (19.0)	
4th year	39 (88.6)	5 (11.4)	
Academic performance			
Excellent	66 (69.5)	29 (30.5)	**0.020**
Good	236 (78.1)	66 (21.9)	
Average	20 (58.8)	14 (41.2)	
Living with			
Both parents	285 (73.8)	101 (26.2)	0.221
Other	37 (82.2)	8 (17.8)	
Low self-esteem score			

No	93 (77.5)	27 (22.5)	0.408
Yes	229 (73.6)	82 (26.4)	
Satisfaction scale			
Extreme not	35 (77.8)	10 (22.2)	0.790
Not satisfaction	65 (71.4)	26 (28.6)	
Neutral	35 (72.9)	13 (27.1)	
Satisfaction	116 (73.9)	41 (26.1)	
Extreme satisfaction	71 (78.9)	19 (21.1)	
Symptom of depression			
No	214 (81.7)	48 (18.3)	**<0.001**
Yes	108 (63.9)	61 (36.1)	
Symptom of anxiety			**<0.001**
No	201 (83.1)	41 (16.9)	
Yes	121 (64.0)	68 (36.0)	
Symptom of stress			
No	232 (84.7)	42 (15.3)	**<0.001**
Yes	90 (57.3)	67 (42.7)	
Time daily using internet (hour)- Mean (SD)	5.93 (3.04)	7.71 (4.39)	**<0.001**
Loneliness score - Mean (SD)	22.06 (10.60)	29.13 (13.21)	**<0.001**

The proportion of internet addiction among students who had average academic performance was 41.2%, higher than those with excellent academic performance (30.5%). The internet addiction was also more common among those who had symptoms of depression (36.1% yes vs. 18.3% no, $p < 0.001$), anxiety (36.0% yes vs. 16.9% no, $p < 0.001$), and stress (42.7% yes vs. 15.3% no, $p < 0.001$). The mean daily time using internet and the mean loneliness score of internet addicts were 7.71 (SD = 4.39) hours and 29.13 (SD = 13.21), respectively. These figures for non-internet addicts were lower, at 5.93 (SD = 3.04) hours ($p < 0.001$) and 22.06 (SD = 10.60) ($p < 0.001$), respectively.

Logistic regressions for factors associated with Internet addiction among students are shown in table 3. After controlling for other variables in the model, academic performance, symptom of stress, time daily using the internet, and loneliness were shown to be independently significant correlates of the internet addiction. Students with good academic performance were found to have a lower odd of having internet addiction than students with excellent academic performance (OR = 0.41; [95% CI: 0.22-0.77]; p = 0.006). Students with the symptom of stress had a 2.76 timeshigherodds of internet addiction than students without stress (OR=2.76; [95%CI:1.43-5.31]; p=0.002). Besides, the more lonely students felt and the more time spent on the internet, the higher the odds of internet addiction they encountered, OR = 1.03; [95% CI: 1.01-1.08]; p = 0.016 and OR = 1.15; [95% CI: 1.07-1.23]; $p < 0.001$, respectively.

Table 3: Factors associated with internet addiction among students

Characteristics	Unadjusted analysis		Adjusted analysis		P value
	OR	95% CI	OR	95% CI	
Sex (ref**:** Male)					
Female	0.84	(0.51-1.38)	0.58	(0.32-1.06)	0.078
Grade (ref: Freshman)					
2nd year	1.31	(0.45-3.77)	1.29	(0.32-5.21)	0.721
3rd year	0.66	(0.22-1.98)	0.60	(0.15-2.41)	0.473
4th year	0.36	(0.09-1.43)	0.55	(0.10-2.92)	0.479
Academic performance (ref: Excellent)					
Good	0.64	(0.38-1.07)	**0.41**	**(0.22-0.77)**	**0.006**
Average	1.59	(0.71-3.58)	1.17	(0.41-3.29)	0.769
Living with (ref: Both parents)					
Other	0.61	(0.27-1.35)	0.55	(0.20-1.52)	0.250
Low self-esteem score (ref: No)					
Yes	1.23	(0.75-2.03)	1.17	(0.64-2.15)	0.605
Satisfaction scale (ref: Neutral)					
Extreme not	0.77	(0.30-1.99)	0.56	(0.18-1.76)	0.320
Not satisfaction	1.08	(0.49-2.35)	0.76	(0.30-1.91)	0.552
Satisfaction	0.95	(0.46-1.97)	1.13	(0.47-2.68)	0.788
Extreme satisfaction	0.72	(0.32-1.63)	1.02	(0.39-2.67)	0.974
Symptom of depression (ref: No)					
Yes	2.52***	(1.62-3.92)	0.79	(0.41-1.51)	0.471

Symptom of anxiety (ref: No)					
Yes	2.76***	(1.76-4.31)	1.59	(0.82-3.08)	0.168
Symptom of stress (ref: No)					
Yes	4.11***	(2.61-6.49)	**2.76**	**(1.43-5.31)**	**0.002**
Time daily using internet (hour)	1.15***	(1.08-1.22)	**1.15**	**(1.07-1.23)**	**0.000**
Loneliness score	1.05***	(1.03-1.08)	**1.03**	**(1.01-1.06)**	**0.016**

*$p<$ 0.05- **$p<$ 0.01- ***$p<$ 0.001

DISCUSSION

To our knowledge, this is the first study about Internet addiction and its related factors among college students in Hanoi, Vietnam. Given the negative impacts of Internet addictionon student's life, an examination ofstudents' Internet addiction rate and its related factorsis essential toproposing prevention and intervention measuresat universities and in the community.

This study found that 25.5% of students surveyed were addicted to the Internet. Internet addiction was significantly higher among students who spent more time on the Internet. Students with excellent academic results faced higher risks of addiction than students with good academic performance. Psychological health-related factors such as stress and loneliness were closely related to the level of Internet addiction in students. There wasno relationship between Internet addiction and factors such as gender, family situation, self-esteem, life satisfaction, depression and anxiety.

The rate of Internet addiction among students in Hanoi is similar to the rate reported in Turkey(Bozoglan *et al*, 2013), Pakistan (Azher*et al*, 2014), Hong Kong(Shek *et al*., 2008). In Vietnam, while there has not been any study on Internet addiction in college students, the rate of Internet addiction in secondary students ranged from 10% to 15.5% (Dang and Nguyen, 2013; Le, 2016). The rate of addiction in secondary school students might be lower than in college students because secondary school students in Vietnam are under stricter supervision from their family and school, while college students have more freedom in controlling their Internet usage.

Among the factors that have statistically significant relationships with Internet addiction among university students, Internet usage has a very strong relationship with Internet addiction among students. This finding is similar to those of previous studies (Chak and Leung, 2004; Griffiths, 1998). The more students use the Internet, the higher risk of addiction they face. Once addicted, students seek pleasure in using the Internet and cannot resist the urge to use more. This two-sided relationship is observed in any type of addiction, supporting the claim that Internet addiction should be officially classified as an addiction.

Our research also shows that students with excellent academic performance have a higher rate of Internet addiction than students with good academic performance. This finding contradicts a previous report of the negative relationship between Internet addiction and academic performance (Kubey, Lavin and Barrow, 2001). It is possible that for Vietnamese youths, excellence in academic performance usually comes with intelligence and high competency in technology. Excellent students do not have to spend too much effort on studying, giving them more time for personal entertainment, the most common and attractive of which is Internet usage. Internet usage becomes a reward for achievements in learning. This mindset is reinforced by Vietnamese parents as they tend to emphasize academic grades more than academic achievements, as such they allow their children more freedom in Internet usage when the children have good academic results. Excellent students also spend more time on the Internet for studying, leading to their longer exposure to the Internet. This might lead to a higher rate of Internet addiction in excellent students. Good students, in contrast, need more time to study, not to mention they are encouraged to do so by their parents and teachers. As such, they have less time and are less encouraged to use the Internet.

Among mental health factors, loneliness and stress increase the risk of Internet addiction in college students; yet no relationship is found between depression and anxiety with addiction. While some previous studies found the relationship between Internet addiction and depression and anxiety (Azher *et al*, 2014; Kim *et al*, 2006; Kima *et al*, 2006; Ostovar *et al*, 2016), others found the benefits of the Internet addiction in reducing anxiety and depression (Bolier, 2013). The Internet provided a getaway from direct social contact, especially when a person is under threat and social stress (Jun and Choi, 2015). It also provided a solution for loneliness (Morahan-Martin, 1999; Stepanikova, Nie and He 2010). This might explain why we found the effect of stress and loneliness on Internet addiction but not depression and anxiety.

Gender, family situation, self-esteem and life satisfaction did not have any effect on Internet addiction in college students. As there remain controversies in the literature about the effect of gender on Internet addiction, this study supports the stance that Internet addiction is independent of gender among Vietnamese college students. About self-esteem, while the negative correlation between self-esteem and Internet addiction hasbeen confirmed in many studies elsewhere (Kim and Davis, 2009; Senol-Durak and Durak, 2011; Sobell, 2007), this study is the first done on Vietnamese youth and fails to replicate the international finding. It might imply the distinct features of Internet usage and addiction in Vietnamese youth. They use the Internet mostly to read and search for information, express themselves, play the game, shop online, connect with friends, etc. As such, their Internet users might not be strongly associated with self-esteem.

Concerning regard to life satisfaction, in this study, we did not find a significant relationship between life satisfaction and Internet addiction. While previous studies found the link between life satisfaction and Internet addiction (Leung and Lee, 2005; Stepanikova, Nie and He, 2010), the link was not strong and can be mediated by cognitive stress and academic performance (Samaha and Hawi, 2016).

There are some limitations to this study. The cross-sectional design of this study does not allow determining reasons. Also, this study relies heavily on self-report. While this is a convenient, practical and popular method to estimate the prevalance of Internet addiction, it has its shortcomings. Like any other psychological disorder, it

requires both quantitative and qualitative assessment to determine if a person is addicted to the Internet. The clinical interview is a very important assessment tool that should be taken into consideration. Future studies should consider multi-measure, multi-method assessmentfor a more comprehensive evaluation.

CONCLUSIONS

This study proves that the rate of Internet addiction among students in Hanoi, Vietnam is not high. Academic performance, Internet usage, stress and loneliness increased the risk of Internet addiction. Prevention and intervention measures should be implemented at universities and in the community to raise awareness of students about Internet addiction as well as its associated factors and to improve mental health for Internet-addicted students.

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Declaration of conflicting interests

The authors declare no conflict of interest.

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