

# Prevalence of Facebook Addiction and Related Factors Among Thai High School Students

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**Objective:** To determine the prevalence of Facebook (FB) addiction and its related factors among Thai high school students.

**Material and Method:** This cross-sectional study was performed among 972 high school students in four provinces associated with high economic prosperity in Thailand: Bangkok, Ubon Ratchathani, Chiang Mai and Songkhla, utilizing a multistage cluster sampling technique. A self-administrative questionnaire was produced composing of three parts; demographic data, a Thai version of the Bergen Facebook Addiction Scale (Thai-BFAS) and the Thai version of the General Health Questionnaire-28 items. Multivariate analysis was employed to analyze the factors associated with FB addiction.

**Results:** The prevalence of FB addiction amongst Thai adolescents was 41.8% (95% CI; 38.6, 45.2). Related factors included gender, school location, sufficiency of personal finance, devices of FB access, duration of staying online via FB, and FB usage during holidays. In addition, every 1-hour increase in usage enhanced the risk for FB addiction (OR = 1.12, 95% CI; 1.05, 1.19).

**Conclusion:** The prevalence of FB addiction in Thai high school students was found to be higher than in many other countries. Related factors should be controlled in order to reduce FB addiction and its detrimental impacts, such as behavior modification and the promotion of healthier free-time activities. Further studies are recommended to understand why FB addiction is so high in Thailand.

**Keywords:** Facebook addiction, High school students

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In Thailand, the duration of internet usage per week has risen dramatically by 76.3% since 2001. The most popular internet activities include sending electronic mails (E-mail), searching for information and data, and using social network sites (SNS)<sup>(1)</sup>. A survey conducted on the behavior of Thai internet users in 2013 showed that the top three most popular SNSs were Facebook (FB), Google+ and Line. In addition, FB accounted for up to 85% of Thai online activity. The most frequent SNS activities were chatting, sharing

experiences and ideas, tracking and updating information about popular events and uploading/sharing photos and videos, respectively<sup>(2)</sup>. Furthermore, people aged less than 15 years, students, and the elderly accessed the internet via personal tablet computers more than any other age groups<sup>(1)</sup>.

“Social Network Site (SNS) addiction” and “Facebook addiction (FB addiction)” are two terms which can be used interchangeably<sup>(3)</sup>. In 1999, Young defined cyber-relationship addiction or SNS addiction as one of five kinds of Internet addiction<sup>(4)</sup> and in 2009 described the criteria for “Facebook Addiction Disorder”. These included neglect of personal life, mental preoccupation, escapism, mood modifying experiences, tolerance, and concealing addictive behavior<sup>(5)</sup>. In a number of countries, there have been

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studies which have indicated the prevalence of Internet addiction in adolescents ranging from 3.7 to 39.6%<sup>(6-12)</sup>, whereas the prevalence of FB addiction ranged from 4 to 8.6%<sup>(13,14)</sup>. However, in Thailand, there are only several studies about internet addiction and FB addiction. These studies have indicated that the prevalence of Internet addiction in Thai adolescents is much higher ranging from 22.0 to 43.2%<sup>(15-17)</sup>. In addition, one study investigated FB addiction by using the time remaining logged on to FB as the classification of FB addiction (no FB addiction ranged from 1 to 4 hours, minor FB addiction ranged from 4 to 9 hours and massive FB addiction score ranged from 9 to 24 hours a week<sup>(18)</sup>). However, there have not been any previous studies carried out in Thailand, which have assessed FB addiction by using an international standardized tool.

In other countries, many researchers have conducted studies about FB Addiction by using the "Bergen Facebook Addiction Scale (BFAS)"<sup>(13,19)</sup>. This BFAS was created by Andreassen et al in 2012 and was employed as a screening test for FB addiction in both epidemiological studies and clinical trials<sup>(20)</sup>. The BFAS was initially authorized, translated into Thai version (Thai-BFAS) and then investigated for its reliability and validity by one of the authors. The Thai-BFAS has good reliability and validity, and conforms well to the original version. Thereby, the present study aims to determine the prevalence of FB addiction and the related factors among Thai teenagers employing the Thai-BFAS as a standardized screening tool. The results of the present study could be applied for planning and determining sensible guidelines of Internet/SNS usage and preventing the detrimental consequences of FB addiction in the future.

## **Material and Method**

### ***Study design and population***

This cross-sectional study was administrated to 992 high schools students randomized through a multistage cluster sampling technique, although 20 of these students failed to participate in the survey. The first stage was a randomized selection which selected 4 provinces from the top ten provinces with the greatest economic prosperity in Thailand<sup>(21)</sup>: Bangkok, Chiang Mai, Ubon Ratchathani and Songkhla. Then one of the large secondary schools in each province was randomly selected. "Large secondary school" was defined by using the reference of the Office of the Basic Education Commission, Ministry of Education<sup>(22)</sup>. Two classrooms per stratum, 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> grade, were selected randomly. The participants, current high school

students, were included while the participants who did not complete the Thai-BFAS questionnaire were excluded. The sample size was estimated using a population proportion formula<sup>(23)</sup>. The variables in this formula were denoted as  $Z_{\alpha/2} = 1.96$ , prevalence of FB addiction ( $p$ ) = 0.43<sup>(24)</sup>,  $q = 1 - p = 0.56$ , acceptance error ( $d$ ) = 0.05 and design effect = 2<sup>(23)</sup>. According to the formula, the number of samples was multiplied by the design effect which was 756 participants. However, the authors prevented errors in the data sampling by increasing the sample size by 10 per cent of sample size; therefore, the final sample size stood at 832 participants.

### ***Measurement***

The authors invented a self-administrative questionnaire that consisted of three steps; the first step was reviewing the associated literature and compiling relevant questions. After that, the questions were assessed by three experts: one psychiatrist, one clinical epidemiologist and one statistician, then they were revised appropriately. Finally, the questionnaire was piloted amongst 30 secondary school students in Bangkok. The questionnaire was revised again before being accepted using. The questionnaire consisted of the following four parts:

#### ***Part 1***

Demographic data such as gender, age, educational level, study program (sciences or arts), cumulative grade point average (GPAX), family member, family relationship, parenting styles (e.g. authoritative, authoritarian, permissive and uninvolved)<sup>(25)</sup>, and leisure activities.

#### ***Part 2***

A FB usage questionnaire that was modified according to the relevant literatures<sup>(11,15,17,26,27)</sup>. The questions included the duration of being a FB user, duration of FB usage, number of FB friends, activities of FB usage, devices and sources to access FB. There were 35 items of FB usage activities, which were categorized into 12 domains such as relationship maintenance, relationship formation, electronic interaction, academic activities, voyeuristic practices, self-presentation activities, online gaming/questionnaires, online shopping, social participation, information exchange, internet pornography, and leisure activities. Each item was rated on a Likert scale with rating scores ranging from 0 = never, 1 = 1-2 times/week, 2 = 3-5 times/week, 3 = 1 time/day, 4 = more 1

time/day. Total score of each domain was calculated using the sum of each Likert scale that belonged to each domain.

### **Part 3**

The Thai-Bergen Facebook Addiction Scale (Thai-BFAS) was employed for screening FB addiction. The Bergen Facebook Addiction Scale (BFAS), self-report questionnaire, was developed in 2011 by Cecilie Schou Andearssen, Torbjorn Torsheim, Geir Scott Brunborg, and Stale Pallesen from the Department of Psychosocial Science, University of Bergen, The Bergen Clinics Foundation, Norway. The original questionnaire was in English and used for screening FB addiction in epidemiological studies and hospital based research. Cronbach's alpha coefficient of the BFAS was 0.83 and the three-week test-retest reliability coefficient was high ( $r = 0.82$ ). The total score ranges from 0 to 24 points. The cutoff score for FB addiction is at least 12 points (e.g. scoring 3 or above on at least four of the six items) which used a polythetic scoring method in order to a liberal approach<sup>(20)</sup>. The original BFAS was authorized for translation and validation in Thai. After content validity and usability were approved by three Thai psychiatrists, the Thai-BFAS was adjusted again by the authors and back translated by an English expert. This final version was studied including the internal consistency and the three-week test-retest reliability performed in 30 pilot high school students in Bangkok. The Thai-BFAS had a Cronbach's alpha coefficient of 0.87 (95% CI; 0.78, 0.93) and the inter-class correlation coefficient was 0.80 (95% CI; 0.49, 0.92)<sup>(28)</sup>.

### **Part 4**

The Thai version of the General Health Questionnaire-28 items (Thai GHQ-28) was used as a mental health screening test. The General Health Questionnaire (GHQ) was developed by Goldberg (1972)<sup>(29)</sup> and has been translated into Thai and tested for reliability and validity by Tana Nilchaikovit and Chakkrit Sukying (1996). GHQ is a screening test for mental health problems in communities that have two key features: an inability to perform normal functions and the presence of difficult situations that cause distress. The internal consistency of Thai GHQ-28 (Cronbach's alpha) was 0.91 and the area under the ROC curve was 0.90. Specificity was 88.2 percent and sensitivity was 81.3 percent, positive predictive value was 76.5 percent and the negative predictive value was 90.9 percent<sup>(30)</sup>. There are 28 multiple choice questions

in total with four choices; each choice has a score of 0 and 1. The total score ranges between 0 and 28 points. The cutoff point is 5 points, which suggests the presence of abnormal mental health.

### **Data collection**

The data were collected from March to June, 2014. Permission was granted to administer this questionnaire from homeroom teachers in each school.

The present study was approved by the Human Ethics Research Committee of Thammasat University; MTU-EC-PS-2-009/57.

### **Statistical methods**

The Statistical Package for the Social Science (SPSS) version 16.0 was used to analyze descriptive statistics such as frequency, percentage, mean, median, standard deviation (SD), interquartile range (IQR), 95% confidence intervals (95% CI), and the statistical significance was set at  $p < 0.05$ . A Chi-square test and independent sample t-test was used to investigate the association of each variable. According to an univariate analysis, if the variable had  $p < 0.20$ <sup>(23)</sup>, it was entered into multivariate analysis, which was employed to analyze the factors associated with FB addiction. In this step, multiple logistic regressions were calculated by using a forward stepwise technique and likelihood ratio test in which the inclusion criteria of variables was set at  $p \leq 0.05$ , while the exclusion criteria of variables was set at  $p \geq 0.1$ .

### **Results**

#### **General characteristics of the FB users**

972 high school students were randomly sampled by using a multistage cluster sampling technique. 872 participated and were current FB users (89.7%) of whom 549 were female (63.0%). The mean age of FB users was  $16.6 \pm 1.0$  years, and their GPAX was  $2.9 \pm 0.5$ . A small majority of them was studying in arts programs (54.2%), whereas 45.8% were in scientific programs. In addition, 76.2% of the FB users had their parents living together, and 83.4% of them were raised through an authoritative parenting style. None of the participants claimed to be raised through an uninvolved pattern.

In terms of FB usage, most of the current FB users accessed FB using smartphones and WIFI (60.5% and 57.3%, respectively). The average of FB usage duration during weekdays was  $3.53 \pm 0.12$  hours per day while most FB users spent their weekends online during the nighttime (43.8%) or all day (41.9%) (Table 1).

**Table 1.** Characteristics of participants

Characteristics	FB addiction (n = 365)		Not FB addiction (n = 507)		p-value
	n	(%)	n	(%)	
Gender <sup>+</sup>					
Male	150	(47.5)	166	(52.5)	<0.050*
Female	201	(38.3)	339	(61.7)	
Age (years); mean ± SD	16.8±1.1		16.6±1.0		<0.050*
School location					
Bangkok	71	(36.0)	126	(64.0)	<0.001*
Chiang Mai	74	(34.7)	139	(65.3)	
Ubon Ratchathani	140	(70.7)	58	(29.3)	
Songkhla	80	(30.3)	184	(69.7)	
Educational level					
10 <sup>th</sup> grade	143	(46.3)	166	(53.7)	<0.050*
11 <sup>th</sup> grade	84	(32.4)	175	(67.6)	
12 <sup>th</sup> grade	138	(45.4)	166	(54.6)	
GPAX; mean±SD	2.9±0.5		3.0±0.5		0.020*
Study program <sup>+</sup>					
Sciences	169	(42.8)	226	(57.2)	0.440
Arts	188	(40.2)	280	(59.8)	
Marital status of parents <sup>+</sup>					
Living together	300	(45.2)	364	(54.8)	<0.050*
Divorced	50	(31.8)	123	(68.2)	
Widowed	14	(28.0)	40	(72.0)	
Parenting style <sup>+</sup>					
Permissive	33	(76.7)	10	(23.3)	<0.001**
Authoritative	285	(39.4)	439	(60.6)	
Authoritarian	45	(44.6)	56	(55.4)	
Devices for access FB <sup>+</sup>					
Smart phone	249	(47.7)	274	(52.3)	<0.001**
Tablets	22	(47.7)	23	(52.3)	
Notebook/Laptop	43	(35.2)	79	(64.8)	
Personal computer	44	(25.3)	130	(74.7)	
Source for access FB <sup>+</sup>					
LAN	25	(22.5)	86	(77.5)	<0.001**
WIFI	210	(42.2)	288	(57.8)	
3G/4G/GPRS/EDGE	130	(49.6)	132	(50.4)	
Duration of FB usage during weekdays (hour/day); mean ± SD	4.6±3.8		2.4±2.7		
FB playing time during weekends <sup>+</sup>					
All day	210	(57.7)	154	(42.7)	<0.001**
Only daytime	36	(29.0)	88	(71.0)	
Only night-time	116	(30.7)	262	(69.3)	
History of LD or ADHD <sup>+</sup>					
ADHD	5	(31.2)	11	(68.8)	0.420
LD	3	(50.0)	3	(50.0)	
Mental health status <sup>+</sup>					
Normal	267	(39.2)	414	(60.8)	<0.050*
Abnormal	98	(51.3)	93	(48.7)	

<sup>+</sup> Missing data but not more than 9.98 per cent of total number, \*  $p < 0.05$ ; \*\*  $p < 0.001$   
LD = Learning Disorders; ADHD = Attention Deficit and Hyperactive Disorder

### **The prevalence of FB addiction and behaviors of FB usage**

The prevalence of FB addiction amongst Thai high school students who were current FB users was 41.8% (95% CI; 38.6, 45.2). According to the school location, Ubon Ratchathani had the highest prevalence of FB addiction (70.7%; 95% CI; 63.8, 76.9), while the prevalence of FB addiction in Bangkok, Chiang Mai, and Songkhla were similar (36.0%; 95% CI; 29.3, 43.1, 34.7%; 95% CI; 28.3, 41.5 and 30.3%; 95% CI; 24.8, 36.2, respectively). Regarding levels of education, the 10<sup>th</sup> grade students had the highest prevalence of FB addiction which was 45.4% (95% CI; 40.6, 52.0), then followed by the 12<sup>th</sup> and 11<sup>th</sup> grade students (45.4%; 95% CI; 39.7, 51.1 and 32.4%; 95% CI; 26.7, 38.5 respectively) (Table 1).

Comparisons between the two groups illustrated that the participants who were FB addicted mostly accessed FB by smartphones and tablets (both equal to 47.7%) and the lowest percentage was found in personal computers (25.3%). Respective of the source of FB access, 49.6% of the participants used Third Generation (3G)/Forth Generation (4G)/General Packet Radio Service (GPRS)/Enhanced Data rates for Global Evolution (EDGE), while local area network (LAN) had the lowest percentage (22.5%) (Table 1).

### **FB usage activities**

There were significant differences in the frequency of FB usage activities between the FB

addiction group and non-FB addiction group. Comparisons between the two groups illustrated that the FB addiction group had higher mean scores in the frequencies of relationship maintenance, electronic interaction, academic activities, voyeuristic practices, self-presentation activities, online gaming/questionnaires, social participation, information exchange, internet pornography and leisure activities. On the other hand, FB addiction group had lower mean scores regarding the frequencies of relationship formation and online shopping (Table 2).

### **Factors related to FB addiction**

According to univariate analysis, there were 29 factors related to FB addiction: age, gender, school location, education level, GPAX, study pattern, marital status of parents, parenting style, father's education level, mother's education level, number of siblings, sibling relationship style, care giver, financial status of family, sufficiency of family finance, sufficiency of personal finance, duration of being FB user, number of FB usernames, number of FB friends, devices for access FB, source for access FB, duration of FB usage during weekdays, time to access FB during weekends, mental health status, and leisure activities; reading, playing sports, watching television and movies, listening to music, taking a nap, playing game, and surfing internet. However, the multivariate analysis found that there were only six factors significantly affecting FB addiction: gender, school location, sufficiency of personal finance,

**Table 2.** Frequency of FB activities between FB addiction groups

Activities of FB usage	Frequency of activities mean (SD)		p-value <sup>+</sup>
	FB addiction (n = 365)	Not FB addiction (n = 507)	
Relationship maintenance	3.2 (0.5)	3.1 (0.5)	<0.050*
Relationship formation	2.9 (0.7)	3.0 (0.7)	<0.001**
Electronic interaction	3.5 (0.9)	3.0 (0.8)	<0.001**
Academic activities	3.6 (0.9)	3.1 (0.9)	<0.001**
Voyeuristic practices	3.6 (1.0)	3.1 (0.9)	<0.001**
Self-presentation activities	3.5 (0.9)	2.3 (1.0)	<0.001**
Online gaming/questionnaires	3.3 (1.2)	2.9 (1.2)	<0.001**
Social participation	3.4 (1.0)	3.1 (0.8)	0.002*
Information exchange	3.5 (1.0)	3.2 (0.9)	<0.001**
Internet pornography	2.9 (1.5)	2.5 (1.8)	0.001*
Online shopping	2.5 (1.2)	2.6 (1.6)	<0.001**
Leisure activities	3.3 (1.2)	2.9 (1.0)	<0.001**

<sup>+</sup> Analyzed by using independent sample t-test, \*  $p < 0.05$ ; \*\*  $p < 0.001$

duration of FB usage during weekdays, time available to play in the holidays, and device for FB access (Table 3).

### Discussion

In the present study, the prevalence of FB addiction and its related factors in Thai high school students was determined using a self-administrative questionnaire which consisted of a FB usage questionnaire, the Thai-BFAS, and the Thai GHQ-28. The prevalence of FB addiction amongst Thai high school students was 41.8%. Supporting findings from previous studies, the prevalence of FB in other countries, the prevalence of FB addiction of Thai adolescents was found to be considerably higher than in the rest of the world. For instance, Isabella Wolniczak et al (2013) reported that the prevalence of FB dependence in German university students was 8.6%<sup>(14)</sup>, Dave E. Marcial (2013) found the prevalence of FB addiction in Philippine university students to be 4.2%<sup>(13)</sup>, and Muge Akyiliz and Metin Argan (2011)

reported that 7.6% of Turkish undergraduate students stayed on FB more than 3 hours a day<sup>(27)</sup>. In terms of previous studies about internet addiction in Thai teenagers, the prevalence of Internet addiction was found to have ranged from 22.0 to 43.2%; however, there have not been any studies that have determined the definite prevalence of FB addiction in Thai high school students<sup>(15-17)</sup>.

The present study found that associated factors of FB addiction included level of gender, school location, sufficiency of personal finance, duration of FB usage during weekdays, time available to play in the holidays, and device for FB access.

The present study found that male gender was one of the risk factors for FB addiction (OR adj = 1.82; 95% CI; 1.20, 2.76). This finding was similar to that of the previous study and explained that males have higher potential to develop addictive behavior in substance, gambling, online gaming as well as the internet<sup>(8,31-33)</sup>. The fact that males possessed more risk of addictive behavior may be due to biological and

**Table 3.** The association among FB addition and related factors

Determinants <sup>+</sup>	n	Addicted (%)	Odds ratio (OR)			
			Crude OR	95% CI	Adjusted OR <sup>+</sup>	95% CI
<b>Gender</b>						
Female	549	210 (38.3)	Ref		Ref	
Male	316	150 (47.5)	1.45	1.10, 1.93*	1.82*	1.20, 2.76*
<b>Educational area</b>						
Bangkok	197	71 (36.0)	Ref		Ref	
Ubon Ratchathani	213	140 (70.7)	4.28	2.74, 6.68*	2.01	1.12, 3.59*
Chiang Mai	198	74 (34.7)	0.94	0.61, 1.44	0.60	0.35, 1.02
Songkhla	264	80 (30.3)	0.77	0.51, 1.16	0.73	0.46, 1.17
<b>Sufficiency of personal finance</b>						
Sufficient	676	220 (32.5)	Ref		Ref	
Insufficient	62	32 (51.6)	2.21	1.26, 3.86*	2.27	1.21, 4.25*
<b>Duration of FB usage (hour/day); mean ± SD</b>						
Time to play in a holiday	872	365 (41.9)	1.24	1.18, 1.31*	1.12	1.05, 1.19*
<b>Time to play in a holiday</b>						
Only daytime	124	36 (29.0)	Ref		Ref	
All day	364	210 (57.7)	3.33	2.10, 5.32*	2.18	1.20, 3.98*
Only night-time	378	116 (30.7)	1.08	0.68, 1.74	0.92	0.50, 1.68
<b>Devices for access FB<sup>+</sup></b>						
Personal computer	174	44 (25.3)	Ref		Ref	
Smart phone	523	249 (47.7)	2.68	1.80, 4.02*	2.02	1.20, 3.38*
Tablets	45	22 (47.7)	2.82	1.35, 5.86*	1.92	0.79, 4.65
Notebook/Laptop	122	43 (35.2)	1.60	0.93, 2.74	1.21	0.62, 2.35

<sup>+</sup> Analyzed by using multiple logistic regressions (forward stepwise technique), Ref = reference group, \*  $p < 0.05$

psychological response.

Regarding levels of education, the 11<sup>th</sup> grade students were found to have the lowest prevalence of FB addiction (32.4%). This finding is contrary to a previous study carried out by the Rajamangala University of Technology Phra NaKhon which found that the level of education was not associated with FB usage<sup>(34)</sup>. Differences in findings may be because the present study assessed FB addiction by using the Thai-BFAS with secondary school students who are younger than university students. According to the school location, Ubon Ratchathani was found to have the highest prevalence of FB addiction (70.7%). In the Thai literature<sup>(17,18,35)</sup>, there have not been any previous studies which have compared the prevalence of FB addiction among the different provinces in Thailand. Consequently, there has been no reason to believe that school location has an affect on the prevalence of FB addiction. In the future, this finding should be investigated in terms of the relationship between economic regions and FB addiction.

In relation to sufficiency of personal finance, the present study found the association between personal finance and FB addiction, indicating that the individual with insufficiency of personal finance had higher risk of developing FB addiction behavior (OR adj = 2.27; 95% CI; 1.21, 4.25). The present study differs from the previous studies which found that high school students in Bangkok received more allowance and had a higher FB addiction risk<sup>(24)</sup>. The difference between these finding may be owing to the different regional settings. The present study was conducted among students not only in Bangkok but also in Chiang Mai, Ubon Ratchathani, and Songkhla in which economic prosperity and cost of living are unequal to those in Bangkok.

In terms of the association between FB addiction and duration of FB usage, the present study found that the FB addiction group had a higher length of FB usage than the non-FB addiction group; the FB addicts stayed online  $4.7 \pm 3.8$  hours per day during the weekdays. These findings are quite similar to a study carried out on Philippine university students in which most of the FB addicts stayed online for up to 3.5 hours a day, and some of the FB addicts stayed online for up to 7 hours a day<sup>(13)</sup>.

In the case of the instrument used to access FB, the present study found that most of the FB addiction group used smartphones and tablets to login to FB. Moreover, 49.6% of the FB addiction group used 3G/4G/GPRS/EDGE to access the FB website. On the

other hand, of the Philippine undergraduate students who were FB addicts, 87% of them were reported to access FB via PC or laptop at home<sup>(13)</sup>. This may be the reason why Thai adolescents were found to have a much higher prevalence of FB addiction, as the use of smartphones with 3G/4G/GPRS/EDGE enabled people to stay online on FB whenever and wherever they wanted. This reason was supported by a study carried out by Nattayaporn Phrarubraks (2014) which found that smartphone and WI-FI were associated with FB addiction in university students due to their simple and easy application<sup>(18)</sup>. In addition, a study about social media consumption behaviors in 2013 reported that most Thai people tended to use smartphones as an instrument to access social network sites at all the places they visited<sup>(36)</sup>.

Another factor that was associated with FB addiction was mental health status. There are many studies, which have shown that Internet addiction is a condition associated with psychiatric disorders. For example, 78% of German students who had internet addiction disorder were reported to have major depressive disorders, and a correlation was found amongst Internet addiction, depression and thoughts of suicide in South Korean adolescents<sup>(37)</sup>. In addition, teenagers who had Internet addiction also suffered from emotional problems, family relationship issues, academic problems, social dysfunction, and mental health problems<sup>(12)</sup>. In univariate analysis, the present study found that the FB addict group had a significantly higher prevalence of abnormal mental health than the normal group, but this factor did not retain in multiple logistic regression model. The present study, which was a cross-section descriptive study design, failed to investigate the causal relationship between FB addiction and mental health status. However, in Thailand, there have not been any relevant studies carried out to discover the relation between physical and psychological impacts of FB usage among adolescents. Further study should be undertaken to explore this causal relationship by using Cohort study design.

In terms of the type of FB usage activities, this present study has shown significant differences in the frequency of FB usage activities between the FB addiction group and non-FB addiction group such as relationship maintenance, relationship formation, electronic interaction, academic activities, voyeuristic practices, self-presentation activities, online gaming/questionnaires, social participation, information exchange, internet pornography, online shopping, and

leisure activities. The present study also draws parallels with several studies carried out by Chia-chen Yang (2013)<sup>(26)</sup>, Daria J. Kuss and Mark D. Griffiths (2011)<sup>(11)</sup>, and Muge Akildiz and Metin Argan (2011)<sup>(27)</sup>, on motivation and reasons for using FB influencing the numbers of hours spent logged on.

The strengths of the present study are an adequate sample size and multicenter collaboration. The authors calculated the sample size in order that it was large enough to ensure adequate power and precision of results. Additionally, this study was designed to involve multicenter collaboration, which allowed for a larger sample size and improved the generalizability of the outcome. In addition to these strengths, the present study assessed FB addiction and mental health by using standardized tools: the Thai-BFAS and Thai GHQ-28. The prevalence of FB addiction in the present study is more accurate and can be compared with other studies. Furthermore, the 5-point scales which are representative of the frequency of FB using behaviors could improve overall accuracy as well. Due to the fact that the present study gave a thorough description of each choice, the subjective nature of the choices could be reduced, for example, "Very rarely = less than once a month, Rarely = less than once a week, Sometimes = more than once a week but not every day, Often = once a day and Very often = more than once a day".

However, the present study also has several limitations. Regarding a cross-sectional study design, the results of the present study can only explain related factors among FB addiction, but can not explain causal association. Another limitation was that the present study assessed only FB addiction which could not represent all of SNS addiction. FB is a kind of SNS which include many sites (Google+, Line, Twitter, and etc). Therefore, further study should be carried out to investigate other SNS in order to reflect the SNS addiction among Thai teenagers. The present study has highlighted that a serious gap of knowledge exists. For example, the reasons why Thai adolescents have a much higher prevalence of FB addiction than other countries, and the factors which lead to higher risks of SNS addiction such as economic status, geographic location, available leisure activities, and behavioral modification for FB usage.

### Conclusion

The prevalence of FB addiction in Thai high school students was found to be higher than in many other countries. The factors that significantly affect FB addiction include gender, school location,

sufficiency of personal finance, devices of FB access, duration of staying online via FB, and FB usage during holidays. These related factors should be controlled in order to reduce FB addiction and its detrimental impacts, such as behavior modification and the promotion of healthier free-time activities. Further studies are recommended to understand why FB addiction is so high in Thailand.

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### Potential conflicts of interest

None.

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## ความชุกและปัจจัยที่มีความสัมพันธ์กับการติดเฟซบุ๊กของนักเรียนมัธยมศึกษาตอนปลายในโรงเรียนขนาดใหญ่

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**วัตถุประสงค์:** เพื่อศึกษาความชุกและปัจจัยที่มีความสัมพันธ์กับการติดเฟซบุ๊กของนักเรียนมัธยมศึกษาตอนปลายในโรงเรียนขนาดใหญ่

**วัสดุและวิธีการ:** เป็นการศึกษาแบบภาคตัดขวางมีนักเรียนมัธยมศึกษาตอนปลายจำนวน 972 ราย ในโรงเรียนขนาดใหญ่ 4 จังหวัดที่มีความเจริญทางเศรษฐกิจสูง ได้แก่ กรุงเทพมหานคร อุบลราชธานี เชียงใหม่ และสงขลา โดยใช้การสุ่มแบบหลายขั้นตอนและใช้แบบสอบถามให้เต็มคำตอบที่ประกอบด้วยข้อมูลส่วนบุคคล Bergen Facebook Addiction Scale (Thai-BFAS) และ General Health Questionnaire-28 ฉบับภาษาไทย (Thai GHQ-28) และวิเคราะห์ห่าปัจจัยที่มีความสัมพันธ์ด้วยวิธี Multivariate analysis

**ผลการศึกษา:** ความชุกการติดเฟซบุ๊กของนักเรียนมัธยมศึกษาตอนปลายเท่ากับร้อยละ 41.8 (95% CI; 38.6, 45.2) ปัจจัยที่มีความสัมพันธ์กับการติดเฟซบุ๊ก ได้แก่ เพศ สถานที่ตั้งของโรงเรียน ความเพียงพอของรายได้ของนักเรียน อุปกรณ์ที่ใช้เล่นเฟซบุ๊ก ระยะเวลาในการเล่นและช่วงเวลาที่เล่นในวันหยุด ซึ่งพบว่าเวลาในการเล่นเฟซบุ๊กที่เพิ่มขึ้นทุก 1 ชั่วโมง มีความเสี่ยงต่อการติดเฟซบุ๊กเพิ่มขึ้น 1.12 เท่า (OR = 1.12, 95% CI; 1.05, 1.19)

**สรุป:** ความชุกของการติดเฟซบุ๊กในนักเรียนมัธยมศึกษาตอนปลายในไทยสูงกว่าในต่างประเทศ ปัจจัยที่มีความสัมพันธ์กับความเสี่ยงต่อการติดเฟซบุ๊ก และผลกระทบที่ควรเฝ้าระวังจัดการและแก้ไข ได้แก่ การปรับพฤติกรรมและการส่งเสริมงานอดิเรกที่เหมาะสม และควรศึกษาเพิ่มเติมถึงสาเหตุที่ความชุกของการติดเฟซบุ๊กในประเทศมีค่าสูงกว่าในประเทศอื่น

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