



## A cross-sectional study on the prevalence of Thai adolescent depression

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### Abstract

This large-scale study aimed to investigate the prevalence of depression in 4,089 Thai adolescents of both sexes. The participants were between 11 and 16 years old and sampled from all the various regions of Thailand to be representative of the entire country. The Thai translation of the Patient Health Questionnaire for Adolescents (PHQ-A) was employed to collect data. Descriptive statistics and chi-square tests of independence were used for data analysis. The results revealed that the vast majority of the participants (72.2%) had either a mild (44.5%; PHQ-A = 5–9) or at least a moderate form of depression (27.7 %; PHQ-A ≥ 10). Further analysis found that females ( $\chi^2 = 41.9, p = .000$ ), poor academic results ( $\chi^2 = 12.7, p = .013$ ), low family income ( $\chi^2 = 18.0, p = .021$ ), suicidal thoughts ( $\chi^2 = 811.0, p = .000$ ) and suicide attempts ( $\chi^2 = 414.4, p = .000$ ) were associated with depression, while age ( $\chi^2 = 8.9, p = .064$ ) was not associated with depression. Compared to worldwide PHQ-A-based studies of adolescent depression, it would appear that the prevalence of depression in Thai adolescents is common and relatively high.

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### Introduction

Depression, as a mental health issue, has a huge impact on adolescents. The World Health Organization (WHO) reported that between 10 to 20 percent of worldwide adolescents struggle with mental health difficulties and depression is one of the most prominent of these difficulties. As the WHO notes, depression can even lead to suicide in worst cases (World Health

Organization [WHO], 2020). Suicide was found as one of the main causes of adolescent deaths (Centers for Disease Control and Prevention, 2021; Croarkin et al., 2018). Even without the prospect of suicide, depression has devastating consequences for adolescents. For instance, depressed adolescents typically feel distressed, unhappy, lonely, guilty, lack confidence and have low self-esteem (World Health Organization [WHO], 2017). This changes their sleep patterns, drains their energy and causes concentration issues (WHO, 2017).

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## Literature Reviews

Previous studies have identified several sociodemographic risk factors for adolescent depression. According to two meta-analyses of sex differences in depression, females more often suffer from major depression, while age was identified as the strongest predictor of effect size with a peak in adolescence (Salk et al., 2017). Moreover, the incidence of adolescent depression was found to increase with age in several studies (e.g. Breslau et al., 2017; Tang et al., 2019). Furthermore, adolescent depression is associated with lower academic performance and poverty (e.g. Cheung et al., 2020; Granrud et al., 2019; López-López et al., 2021; Shah et al., 2020).

In contrast to the great number of conducted studies on so-called WEIRD (Western, Educated, Industrialized, Rich, and Democratic) populations, very much less is known internationally about adolescent depression in non-WEIRD countries like Thailand (Rad et al., 2018). To demonstrate this, it was found that 96 percent of the psychological samples used in international studies were conducted on WEIRD populations, which form only about 12 percent of the world's population in total (Henrich et al., 2010). Therefore, to generate more inclusive findings on, for example, teenage depression, it is imperative to investigate populations from all over the world.

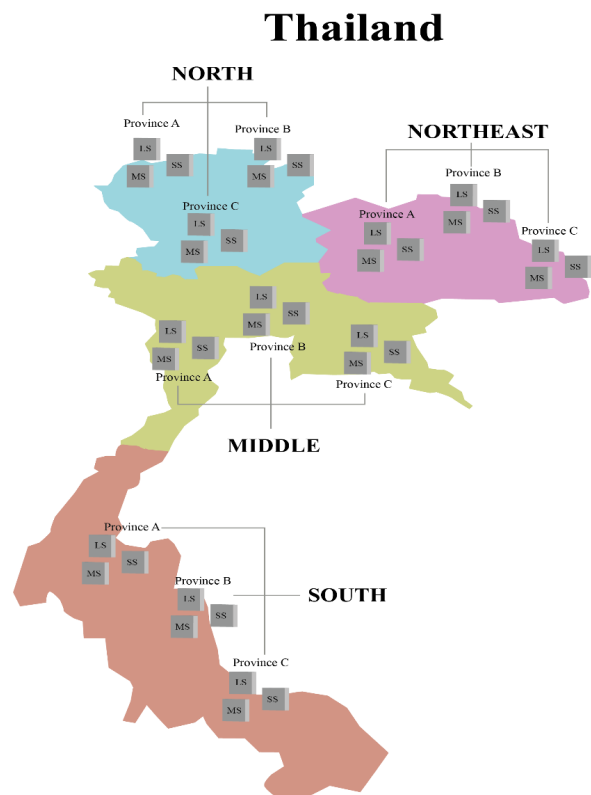
Up until recently, Thai adolescent depression studies were limited to either relatively small populations from one province or to specific settings such as the slums of Bangkok, while depression prevalence was often only briefly mentioned as a secondary outcome (e.g. Somrongthong et al., 2013; Trangkasombat & Rujiradarporn, 2012). According to Charoensuk (2007), the prevalence of adolescent depression, as reported in various Thai studies, varied significantly between regions. For instance, the measured prevalence of major depression was around 20 percent in Chon Buri province, while this percentage was 29 percent in the Ubonrajathanee province and 41 percent in the Sakon Nakhon province. This study (Charoensuk, 2007) expressed the need for a national representative Thai adolescent depression prevalence study. Currently, there is only one study that reported the prevalence of adolescent depression based on a year 2013 sample of schools from every main region of Thailand (Cheung et al., 2020). However, the study was limited to the detection of major depression, whereas mild depression was ignored. Evidence suggests that mild depression increases the risk of developing major depression

(Cuijpers & Smit, 2008; Sadek & Bona, 2000). Furthermore, it was found that mild depression has a significant impact on the quality of life (Cuijpers & Smit, 2008). Therefore, this study aims to present an updated and inclusive picture of the prevalence of adolescent depression, categorized by various depression severity levels, based on a large-scale sample that is representative of the whole of Thailand. Secondly, the study examines socio-demographic variables (sex, age, grade point average [GPA] and monthly family income) as well as suicidal thoughts and suicide attempts, which have all been related to adolescent depression in previous studies.

## Methodology

### Procedure and Sample

Multistage cluster sampling was utilized to sample the adolescent group as shown in Figure 1. All provinces of each of Thailand's four demographic regions (North, Northeast,



**Figure 1** Distribution of the sampled schools across Thailand  
 Note: LS = large-sized school; MS = medium-sized school; SS = small-sized school.

Middle, and South) were stratified by population size. After that, three provinces were obtained per demographic region from a list of stratified provinces by random sampling. A list of schools located within the sampled provinces was then obtained and stratified by population size. The schools were divided into three groups based on school size: large-sized schools ( $> 1,500$  students), medium-sized schools (501–1,500 students) and small-sized schools ( $\leq 500$  students). This was to make sure large schools, which are generally more affluent in Thailand, did not overshadow less affluent middle size and small schools in the country. One school per category was randomly selected out of every sampled province. In total 36 schools were sampled out of 12 provinces for the study. At least 40 voluntary students were selected per school for participation. With these steps, the sampled group was distributed over age and school size so that it was representative of all of Thailand. In total 4,250 participants, aged between 11 and 16 years old, were sampled. Out of all participants, 4,089 (96.2%) fully completed the questionnaires of which 41 percent were male and 59 percent were female.

### *Measures*

The Thai translation of the Patient Health Questionnaire for Adolescents (PHQ-A) was employed to collect data on depression severity. The PHQ-A is a well-established self-report questionnaire for the measurement of depression levels in adolescents (Kroenke, 2021). It consists of a 4-point rating scale featuring nine items, which measures the severity of several depressive symptoms over the previous two weeks. The options are defined as never, some days, more than seven days and almost every day. Furthermore, the PHQ-A measures the prevalence of suicidal thoughts over the past month and lifetime suicide attempts as a secondary outcome. After completion, the questionnaire gives the respondent a score between 0 and 27, which determines their depression level. A 0–4 score suggests no depression, 5–9 suggests mild depression, 10–14 suggests moderate depression, 15–19 suggests moderately severe depression and 20–27 suggests severe depression (Johnson et al., 2002). The internal consistency reliability of the Thai PHQ-A was .92 as determined by Cronbach's alpha coefficient (Panyawong et al., 2020). Sociodemographic variables, including sex, age, GPA and monthly family income, were measured through additional items that were added to the PHQ-A questionnaire.

### *Data Collection*

After the study design was approved by the Research Ethics Review Committee for Research Involving Human Research Participants (Group 1, Chulalongkorn University, Thailand, COA No. 220/2020), school directors were contacted for participation from randomly selected schools in each area denoted in Figure 1. After participation was agreed upon, each school appointed a teacher to act as a research assistant for this study. The research assistants were informed in detail about the study protocol during individual meetings. Furthermore, research assistants were allowed to contact the research team for questions or to discuss any difficulties they may have come across during the data collection phase.

Students and their parents were informed about the aims of the study and the option of not participating. Providing written informed consent, that was signed by the participant as well as the parents, was mandatory for participation. Participants completed the questionnaire after school hours inside their classrooms under the supervision of a research assistant. Verbal instructions about filling out the questionnaires were given by the research assistant as well.

The survey was conducted from September to October 2020. The participants filled in the Thai PHQ-A along with some questions regarding their sociodemographic characteristics after school in a private room under the supervision of the research assistant. Participants were allowed to ask questions to the research assistant if necessary. After the questionnaires were filled in, the data was obtained from the research assistants and physically destroyed after data analysis. The results of the PHQ-A were shown to the participants as well as their parents in private. In case the participant had a moderate depression score or higher ( $\text{PHQ-A} \geq 10$ ) or reported the maximum score on one of the PHQ-A items, the student's school mentor was informed about the results as well.

### *Data Analysis*

Descriptive statistics were used to analyze the sociodemographic variables of the sample (sex, age, GPA and monthly family income). Moreover, chi-square tests of independence were used to determine if there was a relationship between the sociodemographic variables and depression severity scores. The same tests were used to examine whether suicidal thoughts and suicide attempts were related to depression.

**Results**

Table 1 displays the sociodemographic characteristics of the participants. The participants were split into either the young (11–13 years old) or the middle (14–16 years old) adolescent age group. Half of the participants were young adolescents and 59.2 percent were female. Most suffered from at least a mild form of depression, had a high GPA score (3.00 or higher) and were raised in families with low incomes.

**Table 1** Sociodemographic characteristics of the participants (N = 4,089)

Variables	n	%
Sex		
Male	1,670	40.8
Female	2,419	59.2
Age		
11–13 years old	1,983	48.5
14–16 years old	2,106	51.5
GPA		
1.00–2.99	1,479	36.2
3.00–4.00	2,610	63.8
Monthly family income <sup>a</sup>		
Low income	2,201	53.8
Moderate income	1,524	37.3
High income	364	8.9

Note: <sup>a</sup>Low income = less than 20,000 Baht, moderate income = between 20,000–50,000 Baht and high income = more than 50,000 Baht (National Statistical Office of Thailand, 2020).

Table 2 displays the assessed depression scores of the participants divided by degrees of severity. The majority of the participants had at least mild depression (72.2%; PHQ-A ≥ 5). Most participants reported mild depression scores (44.5%; PHQ-A = 5–9), followed by no symptoms of depression (27.8%; PHQ-A = 0–4) and a smaller group that reported moderate depression scores (17.8%; PHQ-A = 10–14). Lastly, a small group reported moderately severe to severe depression scores (9.9%; PHQ-A 15–27).

Table 3 depicts the sociodemographic characteristics of the participants divided by depression severity scores. Chi-square tests of independence were used to determine whether there were relationships between the sociodemographic variables and depression severity scores. While no evidence was found that the age groups were related to depression severity scores ( $\chi^2 = 8.9, p = .064$ ), other relationships were found. There is sufficient evidence to say that there is an association between sex and depression scores ( $\chi^2 = 41.9, p = .000$ ). Furthermore, a relationship was found between GPA scores and depression severity scores ( $\chi^2 = 12.7, p = .013$ ).

**Table 2** Depression severity levels based on PHQ-A (N = 4,089)

Severity of depression based on PHQ-A	n	%
No depression	1,135	27.8
Mild depression	1,821	44.5
Moderate depression	729	17.8
Moderately severe depression	305	7.5
Severe depression	99	2.4

**Table 3** PHQ-A Depression severity and sociodemographic characteristics

Variables	Depression levels <sup>a</sup> (%)					Total	$\chi^2$	p
	0	1	2	3	4			
Sex								
Male	516 (31)	770 (46)	269 (16)	87 (5)	28 (2)	1,670 (41)	41.902	.000*
Female	619 (26)	1,051 (43)	460 (19)	218 (9)	71 (3)	2,419 (59)		
Age (years)								
11–13	569 (29)	892 (45)	353 (18)	130 (6)	39 (2)	1,983 (48)	8.88767	.064
14–16	566 (27)	929 (44)	376 (18)	175 (8)	60 (3)	2,106 (52)		
GPA								
1.00–2.99	373 (25)	658 (45)	287 (19)	127 (9)	34 (2)	1,479 (36)	12.702	.013*
3.00–4.00	762 (29)	1,163 (45)	442 (17)	178 (7)	65 (2)	2,610 (64)		
Monthly family income								
Low	579 (26)	974 (44)	420 (19)	172 (8)	56 (3)	2,201 (54)	18.000	.021*
Moderate	434 (29)	697 (46)	259 (17)	99 (6)	35 (2)	1,524 (37)		
High	122 (34)	150 (41)	50 (14)	34 (9)	8 (2)	364 (9)		
Prevalence of thoughts of death								
Yes	58 (6)	333 (34)	332 (34)	184 (18)	76 (8)	983 (24)	810.969	.000*
No	1,077 (34)	1,488 (48)	397 (13)	121 (4)	23 (1)	3,106 (76)		
Prevalence of suicide attempt								
Yes	30 (6)	151 (31)	159 (33)	97 (20)	46 (10)	483 (12)	414.357	.000*
No	1,105 (31)	1,670 (46)	570 (16)	208 (6)	53 (1)	3,606 (88)		

Note: <sup>a</sup>0 = No depression, 1 = Mild depression, 2 = Moderate depression, 3 = Moderately severe depression, 4 = Severe depression.

\*  $p < .05$ .

Evidence suggests that monthly family income and depression severity scores were related ( $\chi^2 = 18.0, p = .021$ ). Lastly, 24 percent of the participants had suicidal thoughts over the previous month while 12 percent had attempted to commit suicide at least once during their lives. The prevalence of recent suicidal thoughts and lifetime suicide attempts were strongly related to depression with higher depression severity levels predicting a higher prevalence of suicidal thoughts and suicide attempts ( $\chi^2 = 811.0, p = .000$  and  $\chi^2 = 414.4, p = .000$ ).

## Discussion

Prior to this study, there were no large-scale studies conducted on the prevalence of all depression severity levels in Thai adolescents. The findings of the present study reveal that the prevalence of all forms of depression in Thai adolescents was 72.2 percent of which 44.5 percent consisted of mild depression, 17.8 percent of moderate depression and 9.9 percent of moderately severe to severe depression. Table 4 displays the prevalence of adolescent depression reported by international studies that used the PHQ-A questionnaire. In comparison to these studies, the present study revealed a remarkably high prevalence of depression. This should not be taken lightly as mild depression was found to increase the risk of developing major depression and significant quality of life consequences (Cuijpers & Smit, 2008; Sadek & Bona, 2000). Furthermore, the prevalence of moderate to severe depression is comparable to that of the Ethiopian depression study (Tsehay et al., 2020) and lower than that reported in the depression studies from other non-Western countries like Bangladesh, Pakistan and Saudi Arabia (Alharbi et al., 2019; Anjum et al., 2019; Naveed et al., 2019). Nevertheless, the overall prevalence of moderate to severe depression reported in the present

study is still relatively high. For instance, Western adolescent depression studies conducted in Norway and USA (Burdzovic & Brunborg, 2017; Richardson et al., 2010) and some non-Western countries such as China, India and Nigeria (Fatiregun & Kumapayi, 2014; Leung et al., 2020; Singh et al., 2017) all reported lower depression prevalence scores than the present study.

The results indicate that sex is related to depression as Thai female adolescents had higher depression scores than Thai males of the same age. This is consistent with the findings of most Western (e.g. Granrud et al., 2019; Thorisdottir et al., 2017; Van Droogenbroeck et al., 2018) and non-Western studies (e.g. Cheung et al., 2020; Dardas et al., 2021; Shah et al., 2020) regarding teenage depression. According to a study on the mental well-being of male and female adolescents, female teenagers tend to struggle more often with mental issues in general than young men (Bartels et al., 2013). Various studies have attempted to explain this phenomenon based on biological and psychosocial findings. For instance, it is suggested that hormonal differences between both sexes explain why females are more susceptible to depression (Yoon & Kim, 2018). In terms of psychosocial findings, young females are associated with more sexual abuse, gender discrimination, guilt, body image dissatisfaction, self-blame, self-disappointment, feelings of failure and health worries (Bennett et al., 2005; Yoon & Kim, 2018).

Despite evidence from several Western (e.g. Baldursdottir et al., 2017; Breslau et al., 2017; Filatova et al., 2019) and Non-Western studies (e.g. Sandal et al., 2017; Shah et al., 2020; Tang et al., 2019) that age is related to depression, no such evidence was found in the present study as both age groups reported similar depression scores. This finding is however supported by an adolescent depression study from Finland that reported similar depression prevalence scores among teenagers of different ages (Ellonen et al., 2008).

**Table 4** PHQ-A adolescent depression studies

Country	N	Age (years)	Depression levels (%)				
			None	Mild	Moderate	Moderately severe	Severe
Bangladesh <sup>a</sup>	311	13–17	30.9	32.5	20.6	10.9	5.1
China <sup>b</sup>	10,933	11–17	38.9	37.3	16.1	5.5	2.1
Ethiopia <sup>c</sup>	546	14–19	43.2	28.8	18.5	8.2	1.3
India <sup>d</sup>	542	13–18	50.0	29.7	15.5	3.7	1.1
Nigeria <sup>e</sup>	1,713	10–19	44.0	34.8	16.1	4.6	0.5
Norway <sup>f</sup>	846	14–18	46.8	36.1	11.3	3.4	2.4
Pakistan <sup>g</sup>	452	10–17	33.2	35.8	19.5	7.3	4.2
Saudi Arabia <sup>h</sup>	1,245	13–19	26.0	34.0	24.6	10.4	5.0
Thailand <sup>i</sup>	4,089	11–16	27.8	44.5	17.8	7.5	2.4
USA <sup>j</sup>	373	13–17	49.1	32.7	10.5	5.4	2.4

Note: <sup>a</sup>Anjum et al. (2019), <sup>b</sup>Leung et al. (2020), <sup>c</sup>Tsehay et al. (2020), <sup>d</sup>Singh et al. (2017), <sup>e</sup>Fatiregun and Kumapayi (2014), <sup>f</sup>Burdzovic and Brunborg (2017), <sup>g</sup>Naveed et al. (2019), <sup>h</sup>Alharbi et al. (2019), <sup>i</sup>Present study, <sup>j</sup>Richardson et al. (2010).

It was observed that GPA was related to depression as students with poor academic performances (GPA < 3.00) had higher depression scores than students who performed better at school (GPA ≥ 3.00). This is in agreement with several Western (e.g. Fiorilli et al., 2017; López-López et al., 2021; Veríssimo et al., 2020) as well as Non-Western studies (e.g. Charoenwanit, 2019; Cheung et al., 2020; Chi et al., 2020), which claim that poor academic results predict a higher prevalence of depression. This might be partly explained by a study that found that concentration problems and poor self-reliant school performance were related to depression (Fröjd et al., 2008).

Monthly family income was found to be related to depression. It was measured that participants raised in families with low monthly family incomes had higher depression scores than participants who came from richer families. It is interesting to note that low family incomes and poverty have been associated with depression before in Western (e.g. Granrud et al., 2019; Korhonen et al., 2017; Poulsen et al., 2020) and Non-Western studies (e.g. Raheel, 2015; Shah et al., 2020; Wang et al., 2016). According to one study, the family environment, consisting of parental separation and perceived parental support, plays a significant role in the relation between low family income and youth depression (Tracy et al., 2008). Furthermore, poverty was found to have severe consequences on the quality of life (Wong et al., 2015), while previous studies observed that quality of life was negatively associated with depression in teenagers (e.g. Fazeli et al., 2020; Somrongthong et al., 2013).

Compared to all measured variables, depression severity had the strongest relation with suicidal thoughts and suicide attempts. Overall, the prevalence of recent suicidal thoughts and lifetime suicide attempts consistently increased with each depression severity level. Previous studies have observed that suicidal thoughts and suicide attempts were related to depression as well. For instance, an American study on adolescent thoughts of death and suicide found that depressed adolescents had more suicidal thoughts (Stoep et al., 2009). Furthermore, a Chinese adolescent study concluded that the severity of depression was related to suicidal ideation (Kang et al., 2021). Western studies (e.g. Peyre et al., 2017) and Non-Western studies (e.g. Bae et al., 2015) concluded that there was an association between depression severity and suicide attempts.

In general, evidence shows that depression is related to serious health risks for teenagers with higher depression severity levels predicting a much-increased prevalence of suicidal thoughts and suicide attempts. Further exploration of adolescent depression is of vital importance to identify

which factors play a significant role in the development of depression. This could lead to a better understanding of how to treat and prevent depression, which is key for the future of our next generations.

### *Limitation and Advantages*

There were some limitations to how the study was conducted. No temporal relationships could be assessed as data were collected at one point in time. The study had several advantages. Firstly, this is the first national representative Thai adolescent depression prevalence study that measured mild, moderate and major depression levels. This is significant as previous studies were limited to major depression, while mild and moderate depression are associated with several mental health risks (Cuijpers & Smit, 2008; Sadek & Bona, 2000). Secondly, the data are very complete as not many students failed to complete the questionnaire so imputed data was not needed for the analyses.

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### **Conclusion**

Although depression has a devastating impact on adolescent societies worldwide, there is a lack of depression studies conducted in non-Western countries. The present study aimed to measure the prevalence of all depression levels in Thai adolescents on a large scale as a non-Western population. The results suggest that the prevalence of mild to severe depression in Thai adolescents is high (72.2%) compared to other countries. Although the prevalence of moderate to severe depression (27.7%) is comparable to or lower than that of a few studies conducted in other countries, it remains relatively high. Furthermore, there is a significant group of Thai adolescents with mild depression levels (44.5%) who may develop major depressive symptoms, while severe depression was strongly related to suicidal thoughts and suicide attempts. Additionally, the article sheds light on the differences in the prevalence of teenage depression around the world based on PHQ-A assessments. The analysis of most sociodemographic variables (sex, academic performance and poverty) was consistent with previous studies and helped to establish the relationship between these variables and depression.

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### **Conflict of Interest**

The authors declare that there is no conflict of interest.

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