# Factors Predicting Depressive Symptoms Among Thai High School Students

Benjamaporn Rungsang[1,*] & Sutinun Juntorn[2]

[1]General Education, Faculty of Liberal Arts, Mahidol University, Nakhon Pathom, Thailand

[2]Division of Occupational Therapy, Faculty of Physical Therapy, Mahidol University, Nakhon Pathom, Thailand

*Correspondence: General Education, Faculty of Liberal Arts, Mahidol University, Nakhon Pathom, Thailand. E-mail: nokkben.nok@gmail.com

Received: April 11, 2025 Accepted: July 28, 2025 Online Published: September 2, 2025

doi:10.5430/wje.v15n3p1 URL: https://doi.org/10.5430/wje.v15n3p1

**Abstract**

Depression is a mental health issue among high school students. This cross-sectional study examines depressive symptoms and determines the factors predicting it among anonymous Thai high school students. A total of 404 students, with an average age of 14.89 years (SD = 1.66), were selected using a multi-stage sampling technique was employed at an autonomous high school located in Nakhon Pathom, Thailand, during the first semester of the 2023 academic year. A self-administered questionnaire was used to collect the potential factors which had a consistency reliability coefficient of 0.75, and a 9-item patient health questionnaire which had a consistency reliability coefficient of 0.85. Descriptive statistics and stepwise multiple regression analysis were used to analyze the data. The mean score of depressive symptoms was 8.85 (SD = 5.25), which indicates no risk. Four factors were consistently associated with depressive symptoms, with being female the highest significant predictor (β = .251), followed by academic achievement (β = -.167), self-management behaviors (β = -.159), and attitudes towards mental health problems (β = -.143). These four predictors accounted for 20.3% of the variance in depressive symptoms in high school students ($F_{4, 403}$ = 10.715, $p < .001$). These results indicate that educators and school personnel should implement targeted programs or interventions for high school students. Such initiatives are likely to enhance academic performance, foster self-regulation skills, and encourage constructive attitudes toward mental health issues. This approach may be particularly beneficial for female students, potentially reducing the risk of developing depressive symptoms in the future.

**Keywords:** academic achievement, attitudes, depressive symptoms, female, high school students, self-management behavior

## 1. Introduction

According to the World Health Organization, 15 percent of adolescents around the world between the ages of 10- and 19-years old experience a mental disorder, especially depression (World Health Organization [WHO], 2024). Depression ranks among the primary contributors to illness and disability in adolescents. It significantly impairs quality of life by disrupting emotional well-being, cognitive processes, and behavioral functioning (Murungi & Murungi, 2024). Moreover, it can lead to suicide behaviors (Bhattarai, Shrestha & Paudel, 2020; Nakie, Segon, Melkam, Desalegn, & Zeleke, 2022). Adolescents face several challenges, such as independent living, academic stress, and planning for their future education. As a result of these significant challenges, these individuals are more likely to develop depressive symptoms as adults (Tang, Kostyrka-Allchorne, Butura, Phillips-Owen, & Sonuga-Barke, 2024). Studies have shown that the onset of depressive disorders among adults occur during the period of adolescence (Serrano, Cuyugan, Cruz, Mahusay, & Alibudbud, 2023; Hongsrisuwan, 2016). One study found that adolescents who have a history of depressive symptoms have a 15 times higher risk of suicidal attempt behavior than those with no depressive symptoms (Hongsrisuwan, 2016). Therefore, depressive symptoms in high school students may serve as an indicator of suicide among adolescents or depressive disorders among adults when depressive symptoms are often recognized.

Presently, Depression is a widespread mental health concern among high school students, with serious consequences for their well-being and academic achievement (Bhattarai et al., 2020; Serrano et al., 2023). Reported rates of depressive symptoms among this population vary across countries, ranging from 33.5% to 44.2%. For example, prevalence rates have been documented at 33.5% in South Africa (Nabunya et al., 2020), 35.0% in the Philippines (Rukkiat & Panitrat, 2024), 41.4% in Ethiopia (Nakie et al., 2022), and 44.2% in Nepal (Bhattarai et al., 2020). In Thailand, research conducted in Chiang Rai Province found that 21.9% of hill-tribe high school students exhibited depressive symptoms (Thapakorn, Sukhontha, Natnaree, Munsawaengsub, & Apidechkul, 2024). Furthermore, another study reported a 32% prevalence of depressive symptoms among junior high school students (Rukkiat & Panitrat, 2024). Gaining insight into the factors linked to depression in this age group is essential for informing the development of effective prevention and intervention programs.

*1.1 Literature Review*

The existing literature suggests that various factors contribute to depressive symptoms among high school students. These include sociodemographic characteristics and academic factors. For instance, age, gender, parents' marital status, living arrangement, grade level, and academic achievement.

Ultimately, some studies indicate gender differences in depressive symptoms rates. For example, one study found that among senior high school students identified as having depressive symptoms, 30.7 percent were male and 50.7 percent were female (AlAzzam, Abuhammad, Abdalrahim, & Hamdan-Mansour, 2021). Prior studies have highlighted gender as a salient variable linked to depressive symptoms among junior high school students (Rukkiat & Panitrat, 2024), with evidence indicating that female students are more prone to experiencing these symptoms (Nakie et al., 2022; Mkhize, van der Westhuizen, & Sorsdahl, 2024). Age has likewise been identified as a significant predictor of depressive symptoms (Nabunya et al., 2020; AlAzzam et al., 2021; Leung et al., 2023). In addition, family-related factors appear to contribute to the risk of depression. For instance, parental education, particularly the father's level of education, has been shown to significantly predict depressive symptoms in adolescents (AlAzzam et al., 2021; Nabunya et al., 2020). Parents' marital status has also been investigated, which indicated that parental marital status was related to depressive symptoms (Rukkiat & Panitrat, 2024). Moreover, some studies suggest no direct relationship with students' depressive symptoms (Bhattarai et al., 2020; Thapakorn et al., 2024). Although students who live with their parents and are able to share their problems with their parents are less likely to be depressed than those who do not, students may have higher odds of being depressed compared to those in nuclear families (Bhattarai et al., 2020).

Moreover, academic factors can significantly influence depressive symptoms among high school students. Being in a higher grade in school is associated with higher odds of experiencing depressive symptoms (Mkhize et al., 2024). High academic expectations and pressure to succeed can contribute to increased stress and anxiety, which are strong predictors of depressive symptoms (Rukkiat & Panitrat, 2024). Students who feel overwhelmed by their academic workload or fear of failure may be more prone to developing depressive symptoms. Therefore, the prevalence of depressive symptoms in this population has been reported to be high in several studies. (Nakie et al., 2022).

Mental health literacy (MHL) plays a crucial role in the prevention and management of mental health issues, including depressive symptoms. It involves the capacity to identify mental health disorders and knowledge of how to access appropriate support services (Jorm, 2000; Mori et al., 2022). Empirical evidence suggests that limited mental health literacy (MHL) is correlated with increased levels of depressive symptoms (Al-Shannaq, Jaradat, Ta'an, & Jaradat, 2023). This relationship implies that individuals with a reduced understanding of depressive symptoms are more susceptible to experiencing them. According to Jorm (2012), MHL includes several components, such as knowledge of how to identify mental health problems and their causes, comprehension of accessible treatments, attitudes toward people with mental problems, alternatives for self-seeking help, and awareness of successful self-help techniques (Jorm, 2012). Existing research suggests that knowledge of mental health problems is associated with various outcomes, including perceptions, attitudes, and self-seeking help behaviors (Wang & Li, 2024; Puspitasari, Garnisa, Sinuraya, & Witriani, 2022; Yamaguchi, et al. (2020). Literature has consistently found that individuals with a greater familiarity and understanding of mental illnesses demonstrate more compassionate views, exhibit fewer stigmatizing attitudes, and have a reduced desire for social distance from those affected (Wang & Li, 2024; Puspitasari et al., 2022). Furthermore, self-management behaviors constitute a vital component of mental health, as they play a significant role in enhancing an individual's capacity to cope with and manage mental health conditions, including depressive symptoms and other psychological disorders (Wang & Li, 2024). While knowledge, attitudes, and practices (KAP) are commonly used in research of health management (Leung et al.,2023). KAP and MHL are interconnected because knowledge influences attitudes, which in turn shape practices. Jorm's framework

on mental health literacy (2012) supports the idea that improving public knowledge, fostering positive attitudes, and promoting mental health practices can enhance overall mental well-being. However, the relationship between knowledge (K), attitudes towards mental health problems (A), self-management to prevent mental health problems (P), and the experience of depressive symptoms is less clear.

Against this backdrop, the intricate interaction of socio-demographic characteristics, academic performance, mental health knowledge, attitudes toward mental health issues, and self-management behaviors significantly influence students' mental health, especially in relation to depressive symptoms. High school students with higher mental health knowledge, positive attitudes, and effective self-management strategies are better equipped to cope with mental health challenges and prevent the onset of depressive symptoms. In light of the rising prevalence of mental health issues among high school students, it is imperative to further investigate the contributing factors in order to inform the development of targeted interventions that promote adolescent mental well-being. Accordingly, the present study aimed to examine the presence of depressive symptoms among Thai secondary school students. This study also aimed to analyze the association between sociodemographic factors such gender, age, religion, parents' marital status, and living arrangement, academic factors such grade level and academic achievement, and the KAP of secondary school students on depressive symptoms.

Against this backdrop, the intricate interaction of socio-demographic characteristics, academic performance, mental health knowledge, attitudes toward mental health issues, and self-management behaviors significantly influences students' mental health, especially in relation to depressive symptoms. High school students with higher mental health knowledge, positive attitudes, and effective self-management strategies are better equipped to cope with mental health challenges and prevent the onset of depressive symptoms. In light of the rising prevalence of mental health issues among high school students, it is imperative to further investigate the contributing factors in order to inform the development of targeted interventions that promote adolescent mental well-being. Accordingly, the present study aimed to examine the presence of depressive symptoms among Thai secondary school students. This study also aimed to analyze the association between sociodemographic factors such gender, age, religion, parents' marital status, and living arrangement, academic factors such grade level and academic achievement, and the KAP of secondary school students on depressive symptoms.

## 2. Method

### *2.1 Setting and Sample*

This study employed a cross-sectional survey design, conducted during the first semester of the 2023 academic year among secondary school students in Thailand. Data were collected through a self-administered questionnaire, and a total of 404 students were selected from the target population using a multi-stage random sampling method. A secondary school was randomly selected and two classrooms per grade were selected randomly. A total of 12 classrooms with a combination of grades 7-12 were equally included. All students from each selected classroom (approximately 40 students per class) were invited to participate in the study. The inclusion criteria required participants to exhibit general well-being, have no diagnosed mental disorders, and obtain both parental consent and personal assent to participate in the research.

### *2.2 Ethical Considerations*

This study was approved by the Mahidol University Central Institutional Review Board (MU-CIRB) (No.MU-CIRB 2022/140.2812. Participants and their parents were asked to complete a consent form. Prior to signing the consent form, selected participants were invited to participate and were provided with a thorough description of all components of the study which highlighted potential dangers and advantages connected to uncomfortable sentiments caused by the sensitive nature of some questions, as well as the possibility of exhaustion from completing the pencil and paper forms. Students and their parents were also advised that their participation was entirely optional and that they may opt out at any moment without any penalty.

### *2.3 Research Instruments*

Data was obtained using two self-report questionnaires as follows:

The first self-report questionnaire was designed based on the literature (Hongsrisuwan, 2016; Namdej, Phongsakchat, & Sangournpak, 2018; Nabunya et al.,2020; Puspitasari et al., 2020; Yamaguchi et al., 2020; Al-Shannaq et al.,2023; Serrano et al., 2023; Rukkiat, & Panitrat, 2024; Mkhize et al., 2024), with four parts. The first draft of the questionnaire was revised according to the opinions of three experts who gave it a content validity index of 0.97. The questionnaire was

then tested with 30 secondary school students who were excluded from the main sample group. The finalized questionnaire was structured into four parts as follows.

The first part concentrated on sociodemographic factors, such as gender, age, religion, parents' marital status, and living arrangements, and academic factors such as grade level, which were assessed by the sample utilizing a personal information record form. Grade point average (GPA) was also collected, which is common and widely used to measure academic achievement, representing a student's average grade across all courses at the last level, typically on a scale of 0.0 to 4.0.

The second part concentrated on knowledge of mental health problems with 12 items addressing symptoms, cause, and risk factors for mental health problems. The Cronbach's alpha reliability for this part was .76.

The third part concentrated on attitudes towards people with mental health problems with 12 items evaluating attitude towards individuals with mental health problems and treatment approaches. The Cronbach's alpha reliability for this part was .60.

The fourth part concentrated on self-management to prevent mental health problems with 18 items on self-care behavior and self-help-seeking behaviors. The Cronbach's alpha reliability for this part was.77.

In parts 2-4, each item offered three response options: true, false, or 'I don't know.' A correct response earned 1 point, while incorrect and 'I don't know' answers received 0 points. The total scores for knowledge and attitudes toward individuals with mental health issues ranged from 0 to 12, with higher scores reflecting greater mental health knowledge and more positive attitudes. Scores for self-management to prevent mental health problems ranged from 0 – 18, with higher scores indicating better self-management to prevent mental health problems.

The second self-report questionnaire was the Thai version of The Patient Health Questionnaire for Adolescents: PHQ-A (Panyawong, Pavasuthipaisit, & Santitadakul, 2020). This section included 9 items assessing the severity of depressive symptoms experienced over the past two weeks. Participants rated each item on a scale from 0 to 3 (0 = 'not at all' to 3 = 'every day'), with total scores ranging from 0 to 27. Higher scores reflected more severe depressive symptoms. Score interpretations were as follows: 0–4 indicated minimal symptoms, 5–9 mild, 10–14 moderate, 15–19 moderately severe, and 20–27 severe symptoms. To facilitate the identification of students who may benefit from preventative interventions, this scoring method allowed for simple classification into at-risk and not-at-risk groups. The internal consistency for this scale, as measured by Cronbach's alpha, was .85.

### *2.4 Data Collection*

Following approval from the MU-CIRB, the researcher collaborated with designated facilitator teachers to schedule an appropriate time for data collection. Students who had secured parental consent subsequently provided their own informed consent to participate in the study. After completing the survey, participants were given information on available support resources in the event of emotional distress. Moreover, students who reported signs of distress in their responses received contact details for crisis intervention services. Each class was allocated 30 minutes to complete the questionnaire.

### *2.5 Data Analysis*

Descriptive statistics, including frequency, percentage, mean, standard deviation, and range, were employed to summarize the sociodemographic characteristics and key study variables. The Chi-square test was used to examine associations between depressive symptoms and relevant factors. To identify significant predictors, stepwise multiple regression analysis was conducted with candidate variables such as gender, GPA, knowledge, attitudes, and self-management. A significant level of $p < 0.05$ was applied throughout the analytical procedures.

## 3. Results

### *3.1 The Demographic Characteristics of the Sample*

The study sample comprised 404 participants, approximately 63% of whom were female. Participants ranged in age from 12 to 18 years, with a mean age of 14.89 (SD = 1.66). The vast majority (97%) identified as Buddhist. A significant proportion (71.5%) resided with their families, and 71.3% reported that their parents were married. About half of the participants were enrolled in junior high school. Additionally, 91.3% of the students had a grade point average (GPA) exceeding 3.00.

The total scores for depressive symptoms among participants ranged from 0 to 27, with a mean of 8.85 (SD = 5.26), indicating a generally low risk of depression within the sample. Academic achievement scores varied between 2.20

and 4.00, with a mean of 3.62 (SD = 0.36). Knowledge scores related to the topic ranged from 1 to 12, averaging 8.87 (SD = 1.61), while attitudes toward mental health problems ranged from 3 to 12, with a mean score of 6.45 (SD = 1.85). The self-management scores ranged from 6 to 18, with an average of 13.64 (SD = 2.00) (see Table 1).

**Table 1.** Descriptive Statistics of Study Variables (n = 404)

| Variable | Range | *Mean* | *SD* |
|---|---|---|---|
| Depressive symptoms | 0 - 27 | 8.85 | 5.26 |
| Academic achievement | 2.20-4.00 | 3.62 | 0.36 |
| Knowledge of mental health problems | 1 -12 | 8.87 | 1.61 |
| Attitudes towards mental health problems | 3 -12 | 6.45 | 1.85 |
| Self-management behaviors | 6-18 | 13.64 | 2.00 |

Prior to data analysis, the primary assumptions of multivariate analysis—including missing data, outliers, normality, linearity, and multicollinearity—were assessed to minimize potential distortion and bias in the results (Tabachnick & Fidell, 2007). A correlation matrix presenting Pearson's correlation coefficients among the factors predicting depressive symptoms is provided in Table 2 to examine these relationships within a multivariate framework.

**Table 2.** Correlation Matrix of Variables Predicting Depressive Symptoms (n = 404).

| Variable | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Depressive symptoms | 1 | | | | |
| Academic achievement | .223** | 1 | | | |
| Knowledge of mental health problems | .004 ns | .093* | 1 | | |
| Attitudes towards mental health problems | -.212** | -.027 ns | .022 ns | 1 | |
| Self-management behaviors | .058 ns | .109* | .202 ** | .182** | 1 |

* p<.05, **p <.001

*3.2 Factors Predicting Depressive Symptoms*

Stepwise multiple regression analysis was conducted to identify the statistically significant predictors of depressive symptoms and to determine the most influential predictor among secondary school students. Being female was found to be the most significant predictor, accounting for 14.2 percent of the variance explained ($\beta = .251$, $t = 5.012$, $p < .001$). The second most significant predictor was academic achievement which accounted for 3.1 percent of the variance ($\beta = -.167$, $t = -3.412$, $p < .01$). The third most significant predictor was self-management behaviors which accounted for 1.1 percent of the variance ($\beta = -.159$, $t = -3.256$, $p < .01$). The fourth most significant predictor was attitudes towards mental health problems which accounted for 1.9 percent of the variance ($\beta = .143$, $t = 2.871$, $p < .01$). Collectively, the four predictors explained 20.3% of the variance in depressive symptoms among secondary school students, a statistically significant finding ($F_{4, 403} = 10.715$, $p < .001$), as presented in Table 3.

**Table 3.** Stepwise Multiple Regression Statistics of Variables Predicting Depression (n = 404).

| Variable | $\Delta R^2$ | *b* | *SE-b* | *β* | *t* |
|---|---|---|---|---|---|
| Constant | | 19.164 | 3.013 | | 6.360** |
| Being Female | .142 | 2.728 | .554 | .251 | 5.012** |
| Academic achievement | .031 | -2.473 | .725 | -.167 | -3.412* |
| Self-management behaviors | .011 | -.417 | .128 | -.159 | -3.256* |
| Attitudes towards mental health problems | .019 | -.405 | .141 | -.143 | -2.871* |
| $F_{4, 403} = 10.715$** | | | | | |
| $R^2 = .203$ | | | | | |
| Adjust $R^2 = .197$ | | | | | |

* p<.05, **p <.001

## 4. Discussion

Studying depressive symptoms among adolescents is crucial since it contributes to students' illness and disabilities. Two main findings are reported in this study, namely the prevalence of high school students experiencing depressive symptoms and the identification of several factors found to be significantly associated with depressive symptoms.

The average score for depressive symptoms in this study was 8.85 (SD = 5.25, range = 0 - 27) among the participant high school students in the preceding two months. This indicates that this sample has a low risk for depressive symptoms and appears to be less than in previous studies in Thailand (Hongsrisuwan, 2016; Rukkiat & Panitrat, 2024). The low risk of depressive symptoms may result from individuals living with their family and that they are Buddhist. The study found that approximately half of the students resided with their parents, which may serve as a significant protective factor against poor mental health in children (Qin et al., 2021; Butler et al., 2022). Similarly, the participants have a high knowledge of mental health problems (M =8.87, SD = 1.61). Students with greater mental health knowledge reported lower levels of depressive symptoms, potentially due to the association between mental health literacy and more positive attitudes and effective self-management strategies in dealing with mental health issues (Puspitasari et al., 2020; Murungi & Murungi, 2024; Wang & Li, 2024).

To effectively mitigate depressive symptoms among high school students, it is essential to examine the associated risk factors. This study identified female gender, academic performance, self-management behaviors, and attitudes toward mental health as significant predictors of depressive symptoms ($p < .001$), collectively accounting for 20.3% of the variance ($F_{4, 403} = 10.715$, $p < .001$). Female students were particularly at a higher risk, likely due to hormonal changes during adolescence—especially fluctuations in estrogen and progesterone—which can impact mood regulation (Al-Shannaq et al., 2023). Consistent with previous research (Nakie et al., 2022; Mkhize et al., 2024), gender is a significant factor, with studies across various contexts confirming that female adolescents are more susceptible to depressive symptoms (Belayneh & Ergetie, 2024).

Academic achievement was found to be significantly and negatively associated with depressive symptoms ($p < .01$), indicating that higher academic performance correlates with lower levels of reported depression. This result aligns with previous research demonstrating that poor academic performance is linked to increased depressive symptoms (López-López et al., 2021; Qin et al., 2021). For instance, Qin et al. (2021) conducted a study involving 2,567 Chinese adolescents to examine the developmental trajectories of depression following the transition to middle school (grades 7 and 8). The findings revealed that students with lower academic performance were more likely to exhibit high-risk depressive symptoms. Similarly, a longitudinal study by López-López et al. (2021), which followed 3,809 British adolescents aged 11 to 18 across four time points, showed that lower academic achievement at age 14 predicted higher levels of depressive symptoms by age 16, particularly among female students.

Self-management behaviors were also significantly associated with depressive symptoms ($p < .01$), with students exhibiting lower levels of self-management more likely to report symptoms of depression. This relationship can be interpreted within the framework of mental health literacy (MHL), which refers to the knowledge and beliefs that facilitate the recognition, management, and prevention of mental health problems (Jorm, 2012). In this context, the ability to engage in effective self-management practices—such as proactive self-care, problem-solving, maintaining physical activity, and seeking social support—can serve as a protective factor against depression. Students with higher levels of MHL are better equipped to respond to early signs of distress and implement preventive strategies, thereby reducing the risk of developing depressive symptoms. Empirical support for this relationship comes from several studies (Murungi & Murungi, 2024; Wang & Li, 2024). For instance, Wang and Li (2024) conducted a cross-sectional study involving 2,448 university students in Shandong Province, China, and found that while students acknowledged the importance of mental health management, many demonstrated passive engagement in self-care behaviors. Similarly, Murungi and Murungi (2024) investigated the knowledge, attitudes, and practices related to depression prevention among 50 students in Uganda. Their findings revealed inadequate practices and highlighted the need for improved mental health education through community outreach. These findings collectively underscore the importance of self-management behaviors in mitigating depressive symptoms among students.

Attitudes toward mental health were found to be significantly associated with depressive symptoms ($p < .01$), suggesting that students who hold more positive attitudes toward individuals with mental health conditions are less likely to experience depressive symptoms. Such attitudes may foster a more empathetic, inclusive, and non-stigmatizing school environment, thereby reducing emotional distress and social isolation which are common contributors to depression among adolescents. Positive perceptions also facilitate open discussions about mental health, strengthen peer relationships, and promote help-seeking behaviors, all of which are recognized as protective factors against depression. These findings are consistent with previous research (Puspitasari et al., 2020; Al Omari et

al., 2022; Wang & Li, 2024). For instance, Al Omari et al. (2022) conducted an online survey of 400 students and 411 teachers, revealing that male students, those with higher educational attainment, and those with personal connections to individuals with mental illness demonstrated more favorable attitudes. The study highlighted the link between mental health knowledge, positive attitudes, and reduced depressive symptoms. Similarly, Wang and Li (2024) emphasized that students with greater awareness and acceptance of mental health issues are more likely to communicate their concerns to trusted adults. In such supportive environments, stigma is minimized, enabling early intervention and promoting mental well-being.

## 5. Limitations

Several limitations should be acknowledged in interpreting these findings. The cross-sectional design limits causal inference, making it impossible to determine whether the identified predictors are causes or consequences of depressive symptoms. Additionally, the combined predictors explain only 20.3% of variance, indicating that other important factors remain unidentified and warrant further investigation. Furthermore, cultural and contextual factors specific to the study population may limit the generalizability of these findings to other educational settings or demographic groups.

## 6. Conclusions

This cross-sectional study among $7^{th}$-$12^{th}$ grade students indicates there is a low risk for depressive symptoms among this sample. Moreover, the study successfully identified female gender, academic performance, self-management behaviors, and attitudes toward mental health as significant predictors of depressive symptoms ($p < .001$), collectively accounting for 20.3% of the variance ($F_{4, 403} = 10.715$, $p < .001$). The findings of the present study findings suggest that school providers and school employees should plan activities or interventions for high school students. This would increase academic achievement, self-management behaviors, and positive attitudes towards mental health problems, especially among female students. Consequently, future depressive symptoms would decrease. Enhancing positive attitudes towards mental health problems is also important. Moreover, a prevention program could reduce high school students' depressive symptoms by improving academic achievement and teaching them to manage their emotions, stop their negative attitudes towards people with mental health problems, or transform negative attitudes into positive ones. It is recommended that future research employs experimental designs to develop and evaluate intervention programs aimed at reducing depressive symptoms among high school students. Furthermore, the use of longitudinal and qualitative research methodologies is encouraged to provide a more comprehensive understanding of the phenomenon of depression in this population.

## References

Al Omari, O., Khalaf, A., Al Hashmi, I., Al Qadire, M., Abu Shindi, Y., Al Sabei, S., Matani, N., & Jesudoss, D. (2022). A comparison of knowledge and attitude toward mental illness among secondary school students and teachers. *BMC Psychology, 10*(1), 109. https://doi.org/10.1186/s40359-022-00820-w

Al-Shannaq, Y., Jaradat, D., Ta'an, W. A. F., & Jaradat, D. (2023). Depression stigma, depression literacy, and psychological help-seeking attitudes among school and university students. *Archives of Psychiatric Nursing, 46*, 98-106. https://doi.org/10.1016/j.apnu.2023.08.010

AlAzzam, M., Abuhammad, S., Abdalrahim, A., & Hamdan-Mansour, A. M. (2021). Predictors of depression and anxiety among senior high school students during COVID-19 pandemic: The context of home quarantine and online education. *The Journal of School Nursing, 37*(4), 241-248. https://doi.org/10.1177/1059840520988548

Belayneh, M., & Ergetie, T. (2024). Pooled prevalence and associated factors of depression among high school students in Ethiopia. *Discover Psychology, 4*(1), 199. https://doi.org/10.1007/s44202-024-00313-4

Bhattarai, D., Shrestha, N., & Paudel, S. (2020). Prevalence and factors associated with depression among higher secondary school adolescents of Pokhara Metropolitan, Nepal: A cross-sectional study. *BMJ Open, 10*(12), e044042. https://doi.org/10.1136/bmjopen-2020-044042

Butler, N., Quigg, Z., Bates, R., Jones, L., Ashworth, E., Gowland, S., & Jones, M. (2022). The Contributing Role of Family, School, and Peer Supportive Relationships in Protecting the Mental Wellbeing of Children and Adolescents. *School mental health*, *14*(3), 776-788. https://doi.org/10.1007/s12310-022-09502-9

Hongsrisuwan, N. (2016). Depression. *HCU Journal, 19*(38), 105-118. Retrieved from https://anyflip.com/cpqlz/xqke (in Thai)

Jorm, A. F. (2000). Mental health literacy: Public knowledge and beliefs about mental disorders. *The British Journal of Psychiatry, 177*, 396-401. https://doi.org/10.1192/bjp.177.5.396

Jorm, A. F. (2012). Mental health literacy: Empowering the community to take action for better mental health. *American Psychologist, 67*(3), 231-243. https://doi.org/10.1037/a0025957

Leung, D. Y. P., Leung, S. F., Zhang, X. L., Ruan, J. Y., Yeung, W. F., & Mak, Y. W. (2023). Factors associated with severe depressive symptoms among Chinese secondary school students in Hong Kong: A large cross-sectional survey. *Frontiers in Public Health, 11*, 1148528. https://doi.org/10.3389/fpubh.2023.1148528

López-López, J. A., Kwong, A. S. F., Washbrook, L., Tilling, K., Fazel, M. S., & Pearson, R. M. (2021). Depressive symptoms and academic achievement in UK adolescents: A cross-lagged analysis with genetic covariates. *Journal of Affective Disorders, 284*, 104-113. https://doi.org/10.1016/j.jad.2021.01.091

Mkhize, M., van der Westhuizen, C., & Sorsdahl, K. (2024). Prevalence and factors associated with depression and anxiety among young school-going adolescents in the Western Cape Province of South Africa. *Comprehensive Psychiatry, 131*, 152469. https://doi.org/10.1016/j.comppsych.2024.152469

Mori, R., Uchino, T., Mizuno, M., Yamaguchi, T., Katagiri, N., & Nemoto, T. (2022). Effectiveness of a comprehensive mental health literacy educational programme for junior high school students: A randomised controlled trial examining changes in their knowledge, attitudes, and behaviour. *Journal of Personalized Medicine, 12*(8). https://doi.org/10.3390/jpm12081281

Murungi, I., & Murungi, I. (2024). Knowledge, attitude and practices towards preventing depression among students at Kampala School of Health Sciences, Wakiso District: A cross-sectional study. *SJ Mental Health Africa, 1*(7). https://doi.org/10.51168/c5kz9070

Nabunya, P., Damulira, C., Byansi, W., Muwanga, J., Bahar, O. S., Namuwonge, F., Ighofose, E., Brathwaite, R., Tumwesige, W., & Ssewamala, F. M. (2020). Prevalence and correlates of depressive symptoms among high school adolescent girls in southern Uganda. *BMC public health, 20*(1), 1792. https://doi.org/10.1186/s12889-020-09937-2

Nakie, G., Segon, T., Melkam, M., Desalegn, G. T., & Zeleke, T. A. (2022). Prevalence and associated factors of depression, anxiety, and stress among high school students in Northwest Ethiopia, 2021. *BMC Psychiatry, 22*(1), 739. https://doi.org/10.1186/s12888-022-04393-1

Namdej, N., Phongsakchat, P., & Sangournpak, O. (2018). Mental health literacy among senior high school students in Saraburi Province. *Journal of Nursing and Education, 11*(3), 125-138. https://he01.tci-thaijo.org/index.php/JNAE/article/view/152685

Panyawong, W., Pavasuthipaisit, C., & Santitadakul, R. (2020). Validation of the Thai version of the Patient Health Questionnaire for Adolescents (PHQ-A) in adolescent psychiatric patients. *Community Development and Mental Health, 8*(1), 30-40.

Puspitasari, I. M., Garnisa, I. T., Sinuraya, R. K., & Witriani, W. (2020). Perceptions, knowledge, and attitude toward mental health disorders and their treatment among students in an Indonesian university. *Psychology Research and Behavior Management, 13*, 845-854. https://doi.org/10.2147/PRBM.S274337

Qin, X., Kaufman, T., Laninga-Wijnen, L., Ren, P., Zhang, Y., & Veenstra, R. (2021). The impact of academic achievement and parental practices on depressive symptom trajectories among Chinese adolescents. *Research on Child and Adolescent Psychopathology, 49*(10), 1359-1371. https://doi.org/10.1007/s10802-021-00826-9

Rukkiat, M., & Panitrat, R. (2024). Prevalence and factors associated with depression among junior high school students in Laksi district, Bangkok, Thailand. *Kasetsart Journal of Social Sciences, 45*, 443-452. https://doi.org/10.34044/j.kjss.2024.45.2.10

Serrano, I. M. A., Cuyugan, A. M. N., Cruz, K., Mahusay, J. M. A., & Alibudbud, R. (2023). Sociodemographic characteristics, social support, and family history as factors of depression, anxiety, and stress among young adult senior high school students in Metro Manila, Philippines, during the COVID-19 pandemic. *Frontiers in Psychiatry, 14*. https://doi.org/10.3389/fpsyt.2023.1225035

Tabachnick, B. G., & Fidell, L. (2007). *Using multivariate statistics: Multiple regression* (5th ed., pp. 60-195). Pearson.

Tang, P., Kostyrka-Allchorne, K., Butura, A.-M., Phillips-Owen, J., & Sonuga-Barke, E. (2024). Reciprocal developmental pathways between future-related thinking and symptoms of adolescent depression and anxiety: A systematic review and meta-analysis of longitudinal studies. *Clinical Psychology Review*, *112*, 102465. https://doi.org/10.1016/j.cpr.2024.102465

Thapakorn, R., Sukhontha, S., Natnaree, A., Munsawaengsub, C., & Apidechkul, T. (2024). Prevalence and factors associated with depression among hill-tribe high school students in Chiang Rai Province, Thailand: A multilevel cross-sectional study. *Journal of the Medical Association of Thailand, 107*, 708-717. https://doi.org/10.35755/jmedassocthai.2024.9.708-717-792

Wang, X., & Li, C. (2024). Knowledge, attitude, and practice of depression among university students. *Brain and Behavior, 14*(9), e70030. https://doi.org/10.1002/brb3.70030

World Health Organization. (2024). *Mental health of adolescents*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health

Yamaguchi, S., Ojio, Y., Foo, J. C., Michigami, E., Usami, S., Fuyama, T., Onuma, K., Oshima, N., Ando, S., Togo, F., & Sasaki, T. (2020). A quasi-cluster randomized controlled trial of a classroom-based mental health literacy educational intervention to promote knowledge and help-seeking/helping behavior in adolescents. *Journal of Adolescence, 82*, 58-66. https://doi.org/10.1016/j.adolescence.2020.05.002

**Acknowledgments**

We would like to extend our gratitude to Faculty of Liberal art, Mahidol University for providing funding to support this project. We are also grateful to all the participants who generously contributed their time and insights into this study.

**Authors contributions**

Dr. Rungsang and Asst. Prof. Dr. Juntorn were responsible for study design, revising, and data collection. Dr. Rungsang drafted the manuscript. Asst. Prof. Dr. Juntorn revised it. All authors approved the final manuscript.

**Funding**

This research project is supported by the Faculty of Liberal Arts, Mahidol University, for the fiscal year 2022 [project number R06/2565].

**Competing interests**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

**Informed consent**

Obtained.

**Ethics approval**

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

**Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**Data sharing statement**

No additional data are available.