ORIGINAL ARTICLE

Depression, Generalize Anxiety Disorder, and School Avoidance in Early School Years in Pupils with Poor Reading Ability

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Background: Children with poor reading ability may be at risk of early mental health problems.

Objective: To determine an association between poor reading ability and generalize anxiety, school avoidance and depression among pupils in early school years.

Materials and Methods: The cross-sectional study was conducted in 1,038 pupils studying in Grade 2 in 8 primary schools in Thailand. All pupils were individually assessed in their reading abilities by the Thai Standard Reading Tests. Generalized anxiety disorder and significant school avoidance were screened by using the Thai version of the Screen for Child Anxiety Related Emotional Disorders (SCARED). Depression was screened by using the Thai version of the Short Mood and Feelings Questionnaire (SMFQ).

Results: A total of 877 pupils completed the tests. The mean age was 7.0 years (SD 0.4 years). The prevalence of generalized anxiety disorder, significant school avoidance, and depression were 18.4% (95% CI 15.8 to 20.9), 32.2% (95% CI 29.1 to 35.3), and 36.0% (95% CI 32.9 to 39.2), respectively. Poor reading ability was significantly associated with school avoidance with the odds ratio of 2.2 (95% CI 1.5 to 3.3, p<0.001) and depression with the odds ratio of 1.8 (95% CI 1.2 to 2.6, p=0.005), but was not significantly associated with generalized anxiety disorder.

Conclusion: Poor reading ability was associated with school avoidance and depression in early school years. Emotional problems should be screened early in those with poor reading ability.

Keywords: Poor reading ability; Anxiety; Depression; School avoidance; Mental health

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Early primary school is a period when children begin to learn a lot from society and the environment outside the house, through studying, playing, and trying to get things done. Children require the support and assistance of adults and the people around them to develop their full potential without feeling inferior or incompetent. Learning difficulties in school may thus have a huge impact on the mental health of children and their families[1,2].

The common learning problem among students is poor reading ability. Problems in basic reading skills result in difficulties in learning in class since early primary school. Even children with normal intelligence levels may face this issue[3]. These groups of students were considered at-risk for dyslexia. In the United States of America, there was a report of 10% lifetime prevalence of learning disorders, with dyslexia accounting for 80%[4]. In Thailand, a report found the prevalence of dyslexia among primary school students to be 6.3% to 7.8% and 15.81% are at-risk for dyslexia[5-7].

Children with these issues need more time than average children to learn the alphabet, spelling, and reading comprehension, which directly affects academic success. This can cause problems in school, such as falling behind, failing exams, lacking

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confidence in studying, and behavioral issues in the classroom, and may also lead to problems in family relationships and mental health[8,9]. A study found that children with reading difficulty were more likely to experience depression and anxiety than those without[10]. A study of psychiatric disorders in school-aged children in Bangkok found the prevalence of generalized anxiety disorder and depression to be 10.8% and 7.1%, respectively[11].

There has not yet been a Thai study on the relationship of poor reading ability with anxiety and depression among early primary school pupils in Thailand. The researchers therefore wanted to find the extent of generalize anxiety, school avoidance and depression problems in early primary school students nowadays and their association with difficulty in reading.

Materials and Methods

Study population

Grade 2 students from 50 classrooms in 8 schools in Pathum Thani Province and part of the Bangkok metropolitan area, Thailand, were selected by purposive sampling. The sample size calculation method was employed to estimate population proportion by defining an estimated prevalence of generalized anxiety disorder of 0.1[11]. The margin of error (d) of 0.02 resulted in a sample group of 865 students. The authors increased the sample size by 20% to account for non-response participants resulted in a sample group around 1,038 students. Clinical psychologists administered an intelligence-scale test utilizing Raven's progressive matrices[12] to all participants. Those children whose intelligence quotient (IQ) was below 70 were excluded from the study.

Tools

1. The Thai reading test was developed by Vibulpatanavong[13] for measuring reading of primary school students. All participants were asked to do a reading test of meaningful Thai words and 3 short Thai reading passages. The word test score was calculated based on the number of Thai words read correctly within one minute. The Thai reading passage test score was calculated depending on the number of questions correctly answered for vocabulary and content comprehension. The scores were graded appropriately for their class level. Poor reading ability in the present study was defined as having test score less than the 10th percentile of all participants of the same class level.

2. The Screen for Child Anxiety Related Emotional Disorders (SCARED) questionnaire - child version was developed by Birmaher et al.[14]. All participants were asked to complete each question by their 3-Likert scale response. The questionnaire could be used to screen for anxiety related emotional disorders including panic disorder, generalized anxiety disorder, separation anxiety disorder, social anxiety disorder, and significant school avoidance problem[14,15]. Construct validity was performed well against the Child Behavior Checklist (CBCL). Concerning discriminant validity, the area under the curve (AUC) to discriminate among anxiety related emotional disorders and other disorders is 0.67 and the Cronbach's alpha is 0.74 to 0.89[16]. The test was cross-culturally translated into Thai[17]. In the present study, only 13 questions appropriate for the ages of the participants were used to screen for generalized anxiety disorder and significant school avoidance.

3. The Short Mood and Feelings Questionnaire (SMFQ), which is the short version of the Mood and Feelings Questionnaire (MFQ), is a reliable tool for depression screening in children and adolescents[18-20]. The SMFQ consists of 13 questions, reduced from the 33 questions in the MFQ. It has been culturally translated into the Thai version with the Cronbach's alpha coefficient and intra class correlation coefficient of 0.86 and 0.61, respectively[21]. The total scores ranged from 0 to 26 with the Likert's scale of 0 to 2 for each question response. A higher score indicates a higher risk of depression. The cutoff point at 9 points has the sensitivity and specificity of 0.87 and 0.86, respectively.

Procedures

A letter of invitation and consent explaining the research project was distributed to the students' parents. Well trained research assistants read the questions to the students and explained the questions which students did not understand in the SCARED assessment form and the Thai version of the SMFQ assessment form in one classroom at a time. Research assistants were trained by Vibulpatanavong, the developer of the Thai reading test, and subsequently administered the Thai reading test to the participants. The data collection process was entirely concluded in 2019, predating the onset of the COVID-19 pandemic. The present study was approved by the Ethics Committee of Thammasat University (MTU-EC-PE 1-144/63).

Data analysis

Data were analyzed by the Stata, version 14 (StataCorp LP, College Station, TX, USA). Descriptive statistics were used to present continuous data with mean and standard deviation. The prevalence of poor reading ability and generalize anxiety and depression were presented as percentages and their 95% confidence intervals (CIs). The outcomes in the present study consisted of generalized anxiety disorder, significant school avoidance, and depression. A multivariable logistic regression was used to determine the effect of poor reading ability on the particular outcome with the final model including sex, school affiliation, paternal and maternal education level, and family income. The statistical significance level was determined at the p-value less than 0.05.

Results

A total of 877 pupils provided complete information and were tested. The proportion of male pupils was roughly similar to that of female pupils. The mean age was 7.0 years (SD 0.4 years). Both public and private schools participated in the present study. Approximately 25% of parents had the education level of junior high school. Around 30% finished senior high school, and 14% to 20% graduated with a Bachelor's degree or above. About 54% had an average family income of 10,000 to 30,000 Baht, around 237 to 711 pound (GBP) per month. Other data were displayed in Table 1.

The screening results based on scores from reading Thai words and passages found that 124 students (14.1%) experienced poor reading ability. Moreover, 18.4% had generalized anxiety disorder; 32.2% had significant school avoidance, and 36.0% had depression. Details were displayed in Table 2.

Logistic regression analysis controlled for sex, school affiliation, paternal and maternal education level, and family income, found that poor reading ability was associated with significant school avoidance with the odds ratio of 2.2 (95% CI 1.5 to 3.3, p<0.001) and depression with the odds ratio of 1.8 (95% CI 1.2 to 2.6, p=0.005). However, poor reading ability was not significantly associated with generalized anxiety disorder. Details were displayed in Table 3.

Table 1. Characteristics of students participating in the study (n=877)

Characteristics	Number	Percent
Sex		
Female	441	50.29
Male	436	49.71
Mean age (years)	7±0.4	
School affiliation		
Office of the Basic Education Commission	356	40.59
Provincial Administration Organization	248	28.28
Private	273	31.13
Maternal education level		
None	16	1.82
Primary school	101	11.52
Junior high school	213	24.29
Senior high school/vocational certificate	290	33.07
Diploma/high vocational certificate	78	8.89
Bachelor's degree or above	179	20.41
Paternal education level		
None	13	1.48
Primary school	113	12.88
Junior high school	230	26.23
Senior high school/vocational certificate	274	31.24
Diploma/high vocational certificate	124	14.14
Bachelor's degree or above	123	14.03
Average family income per month (Baht)		
<10,000	194	22.12
10,000 to 30,000	477	54.39
30,000 to 50,000	140	15.96
50,000 to 100,000	51	5.82
>100,000	15	1.71

Table 2. The prevalence of poor reading ability, generalized anxiety disorder, significant school avoidance, and depression (n=877)

Problem	Number	Prevalence	95% CI
Poor reading ability	124	14.1	11.8 to 16.5
Generalized anxiety disorder	161	18.4	15.8 to 20.9
Significant school avoidance	282	32.2	29.1 to 35.3
Depression	316	36.0	32.9 to 39.2

CI=confidence interval

Discussion

The present study found that 18.4% of early primary school pupils were at risk of generalized anxiety disorder, 32.2% were prone to significant school avoidance, and 36.0% were likely to have depression. These figures are very high compared to the study in 2002[11]. Investigating psychiatric disorders in school-aged children in Bangkok, the prevalence of generalized anxiety disorder and depression were found to be 10.8% and 7.1%, respectively. However, these two studies differed both in child age and applied tools. In the previous study,

Table 3. Factors associated with generalized anxiety, significant school avoidance, and depression

Factor	Generalized anxiety		Significant school avoidance		Depression	
	Odds ratio* (95% CI)	p-value	Odds ratio* (95% CI)	p-value	Odds ratio* (95% CI)	p-value
Poor reading ability	1.3 (0.8 to 2.1)	0.298	2.2 (1.5 to 3.3)	<0.001	1.8 (1.2 to 2.6)	0.005
Male	1.3 (0.9 to 1.8)	0.133	0.9 (0.7 to 1.3)	0.641	1.1 (0.9 to 1.5)	0.411
School affiliation						
Office of the Basic Education Commission	Reference		Reference		Reference	
Provincial Administration Organization	1.3 (0.9 to 2.0)	0.288	1.3 (0.9 to 1.8)	0.186	1.3 (0.9 to 1.8)	0.153
Private	1.2 (0.7 to 1.8)	0.278	1.2 (0.8 to 1.7)	0.391	0.9 (0.7 to 1.4)	0.744
Maternal education level						
None	Reference		Reference		Reference	
Primary school	1.0 (0.2 to 4.6)	0.962	0.5 (0.2 to 1.7)	0.271	0.5 (0.1 to 1.6)	0.227
Junior high school	1.1 (0.3 to 5.3)	0.859	0.7 (0.2 to 2.4)	0.620	0.6 (0.2 to 1.9)	0.354
Senior high school/vocational certificate	1.4 (0.3 to 6.7)	0.641	0.5 (0.2 to 1.7)	0.271	0.6 (0.2 to 1.6	0.371
Diploma/high vocational certificate	1.2 (0.2 to 6.2)	0.822	0.4 (0.1 to 1.6)	0.209	0.4 (0.1 to 1.6)	0.205
Bachelor's degree or above	1.4 (0.3 to 6.7)	0.689	0.4 (0.1 to 1.3)	0.112	0.5 (0.1 to 1.6)	0.240
Paternal education level						
None	Reference		Reference		Reference	
Primary school	0.6 (0.1 to 2.9)	0.518	1.9 (0.5 to 8.0)	0.356	0.6 (0.2 to 2.4)	0.510
Junior high school	0.5 (0.1 to 2.4)	0.397	1.3 (0.3 to 5.4)	0.705	0.5 (0.1 to 1.7)	0.321
Senior high school/vocational certificate	0.5 (0.1 to 2.3)	0.361	1.5 (0.4 to 6.0)	0.608	0.6 (0.2 to 2.1)	0.396
Diploma/high vocational certificate	0.4 (0.1 to 2.0)	0.246	1.0 (0.2 to 4.6)	0.956	0.3 (0.8 to 1.3)	0.112
Bachelor's degree or above	0.4 (0.1 to 2.1)	0.269	1.3 (0.3 to 5.9)	0.692	0.5 (0.1 to 1.8)	0.252
Average family income per month (Baht)						
<10,000	Reference		Reference		Reference	
10,000 to 30,000	1.3 (0.5 to 2.1)	0.286	1.1 (0.7 to 1.5)	0.803	1.3 (0.9 to 1.8)	0.223
30,000 to 50,000	1.4 (0.7 to 2.6)	0.368	1.4 (0.8 to 2.4)	0.216	1.6 (0.9 to 2.7)	0.092
50,000 to 100,000	1.6 (0.7 to 3.9)	0.298	1.4 (0.7 to 3.1)	0.359	2.1 (1.0 to 4.5)	0.042

CI=confidence interval

* Adjusted odd ratio by multivariable logistic regression model

the participants were 8 to 11 years old, older than the mean age in the present study. Furthermore, the tool applied in the original study was parent and child interviewer-based structured diagnostic interview, while the present study only used a screening tool, resulting in much higher prevalence. When compared to the prevalence rates from a study conducted in Indonesia, which utilized the same assessment tools (SCARED), it was revealed that 40% of students aged 10 to 11 had generalized anxiety, and 28.9% experienced school avoidance[22]. The present study found a lower occurrence of generalized anxiety disorder but similar rates of school avoidance. It is worth noting that the sample in the present study consisted of a younger age group, which could potentially contribute to a lower prevalence of generalized anxiety disorder.

In terms of mental health risk, the association of school avoidance and depression with poor reading ability in children, found from analysis (controlled for sex, school affiliation, parental education level, and family income), showed that emotional issues might be associated with poor reading ability. The finding is consistent with numerous studies which pointed out that children with poor reading ability were more likely to experience depression and anxiety than those without[10,23]. It could be explained that poor reading ability results in learning problems, such as falling behind, failing exams, and getting scolded by teachers. The combination of these factors can contribute to a child with reading difficulties experiencing fear and anxiety when it comes to attending school, which can ultimately result in school avoidance. These issues led the individuals to lose confidence in studying and in themselves, to feel discouraged, to become unhappy, and to have low self-esteem. The present study also revealed that the consequences of poor reading ability, which might lead to emotional problems, can be detected from early primary school. Nevertheless, the present study

did not identify a significant association between generalized anxiety disorder and poor reading ability. This lack of association could potentially be attributed to the younger age of the participants, as they may not exhibit generalized anxiety disorder symptoms as prominently as they do by school avoidance or depression.

Nonetheless, because this was a cross-sectional study, the correlation should not be assumed as the causation. It could also be that emotional problems were the cause of poor reading ability. Children with emotional issues tend to be distracted, unable to concentrate, unhappy, and short on motivation to learn[2]. Yet, there exists a flaw to this standpoint: generalized anxiety disorder, which can also make students unable to concentrate, was not found to be associated with poor reading ability.

The study possesses many strengths. It examined students from early primary school, when reading and mental health problems can begin to form. Many types of schools were included in the present study. The screening tests for emotional problems relied on information directly from the children, which is better for obtaining internalizing problems than information from proxy, i.e., parents and teachers. Moreover, the present study used examiners with the same training for all students. The examiners read the questions to the children and explained the questions which they did not understand, making the collected information credible.

However, there are some limitations to the present study. Causality cannot be firmly determined due to its cross-sectional nature. In addition, the study was conducted in a single province, which is a suburban area. In other zones with distinct environments, the results might be different. Also, there are many other factors apart from poor reading ability which can affect emotional problems in children that were not included in the study, for example the underlying disease of the students. Thus, there should be a follow-up on the long-term consequences of poor reading ability and mental health problems in children as well as the study focuses on protective factors that reduce poor reading ability and their long-term impact on children's mental health problems.

Conclusion and recommendation

School avoidance and depression are associated with poor reading ability, which can be screened and detected from early primary school. To provide appropriate assistance to children with poor reading ability, there should be assessment, supervision, and follow-up of emotional problems from early on so that they can develop properly in intellectual, emotional, and social aspects.

What is already known on this topic?

Children who with reading difficulties are at a higher risk of developing depression and anxiety later in life. However, there is currently no research conducted in Thailand that investigates the link between reading difficulties and anxiety/depression in early primary school children.

What does this study add?

School avoidance and depression have been found to be associated with children who experience reading difficulties from an early age in primary school. Therefore, it is important to screen and identify these issues as early as possible.

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Conflicts of interest

The authors declare no conflict of interest.

References

1. Ruangdaraganon N. Learning disabilities. In: Ruangdaraganon N, editor. Child development and behavior textbook. Bangkok: Holistic Publishing; 2008. p. 246-64.
2. Rojmahamongkol P. Specific learning disorder. In: Boon-yasidhi V, editor. Child and adolescent psychiatry in clinical practice. Bangkok: Department of Pediatrics, Faculty of Medicine, Siriraj Hospital Mahidol University; 2021. p. 125-56.
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. Section II, Neurodevelopmental disorder. Arlington, VA: APA; 2013. p. 31-86.
4. Altarac M, Saroha E. Lifetime prevalence of learning disability among US children. Pediatrics 2007;119 Suppl 1:S77-83.
5. Roongpraiwan R, Ruangdaraganon N, Visudhiphan P, Santikul K. Prevalence and clinical characteristics of dyslexia in primary school students. J Med Assoc Thai 2002;85 Suppl 4:S1097-103.
6. Sangsupavanich P, Tantivej S, Tosagaun K. School-based screening for attention deficit and hyperactivity disorder (ADHD) and learning disorders (LD). Bangkok: Thai Health Promotion Foundation. 2011.

7. Lerthattasilp T, Sritipsukho P, Chunsuwan I. Reading Problems and Risk of Dyslexia Among Early Elementary Students in Thailand. J Popul Soc Stud 2022;30:726-40.
8. Arnold EM, Goldston DB, Walsh AK, Reboussin BA, Daniel SS, Hickman E, et al. Severity of emotional and behavioral problems among poor and typical readers. J Abnorm Child Psychol 2005;33:205-17.
9. Boland R, Verdiun M, Ruiz P. Specific learning disorder. In: Boland R, Verdiun M, Ruiz P, editors. Kaplan & Sadock's synopsis of psychiatry. 12th ed. Philadelphia Lippincott Williams & Wilkins; 2022. p. 141-9.
10. Livingston EM, Siegel LS, Ribary U. Developmental dyslexia: Emotional impact and consequences. Aust J Learn Diffic 2018;23:107-35.
11. Wacharasindhu A, Panyyayong B. Psychiatric disorders in Thai school-aged children: I Prevalence. J Med Assoc Thai 2002;85 Suppl 1:S125-36.
12. Raven JC, Court JH. Manual for raven's progressive matrices and vocabulary scales. Section 1: General overview. San Antonio, TX: Harcourt Assessment; 2003.
13. Vibulpatanavong K. The development of phonological awareness and the relationship between phonological awareness and Thai Language reading ability in lower primary school students in Thailand. Sydney, Australia: University of Sydney; 2012.
14. Birmaher B, Khetarpal S, Brent D, Cully M, Balach L, Kaufman J, et al. The Screen for Child Anxiety Related Emotional Disorders (SCARED): scale construction and psychometric characteristics. J Am Acad Child Adolesc Psychiatry 1997;36:545-53.
15. Hale WW 3rd, Crocetti E, Raaijmakers QA, Meeus WH. A meta-analysis of the cross-cultural psychometric properties of the Screen for Child Anxiety Related motional Disorders (SCARED). J Child Psychol Psychiatry 2011;52:80-90.
16. Monga S, Birmaher B, Chiappetta L, Brent D, Kaufman J, Bridge J, et al. Screen for Child Anxiety-Related Emotional Disorders (SCARED): convergent and divergent validity. Depress Anxiety 2000;12:85-91.
17. Tangjittiporn T, Sottimanon A, Ularntinon S. Psychometric properties of the Screen for Child Anxiety Related Disorders Thai version. Pediatr Int 2022;64:e15093.
18. Daviss WB, Birmaher B, Melhem NA, Axelson DA, Michaels SM, Brent DA. Criterion validity of the Mood and Feelings Questionnaire for depressive episodes in clinic and non-clinic subjects. J Child Psychol Psychiatry 2006;47:927-34.
19. Thapar A, McGuffin P. Validity of the shortened Mood and Feelings Questionnaire in a community sample of children and adolescents: a preliminary research note. Psychiatry Res 1998;81:259-68.
20. Sharp C, Goodyer IM, Croudace TJ. The Short Mood and Feelings Questionnaire (SMFQ): a unidimensional item response theory and categorical data factor analysis of self-report ratings from a community sample of 7-through 11-year-old children. J Abnorm Child Psychol 2006;34:379-91.
21. Lerthattasilp T, Tapanadechopone P, Butrdeewong P. Validity and reliability of the Thai version of the short mood and feelings questionnaire. East Asian Arch Psychiatry 2020;30:48-51.
22. Niman S, Dewa DK, Indriarini MY. The prevalent anxiety disorders among elementary students in Bandung, Indonesia. J Public Health Res 2021;10:jphr.2021.408.
23. Margaret J, Snowling MJ, Charles H. Disorders of reading, mathematical and motor development. In: Thapar A, Pine DS, Leckman JF, Scott S, Snowling MJ, Taylor EA, editors. Rutter's child and adolescent psychiatry. 6th ed. New York, NY: John Wiley & Sons; 2017. p. 702-18.