Behavioral Problems in Grade One Students with Reading Difficulties in Thailand: A Cross-Sectional Study

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ABSTRACT

Objective: Children with reading difficulties face a number of challenges when entering school. Numerous studies have revealed greater behavioral and emotional problems in children with reading disorders. There is limited data on the challenges faced by young struggling readers in Thailand. This study aimed to investigate behavioral and emotional problems in grade one students, comparing between children with and those without reading problems.

Materials and Methods: A cross-sectional study was conducted of 901 grade one children in Thailand. The parental version of the Strengths and Difficulties Questionnaire (SDQ) was completed by parents along with a questionnaire of demographic data. Homeroom teachers completed the SDQ, teacher version. Reading assessments were performed to determine which students had reading difficulty.

Results: Based on reading test scores, 131 students were considered to have reading difficulty. Students with reading difficulty were found to have significantly more behavioral and emotional problems in almost all aspects of the SDQ than children who were typical readers since they had just attended the formal education system. Overall, teachers reported five times as many problems in struggling readers, while parents reported twice as many.

Conclusion: Thai grade one students with reading difficulty appear to have significantly more emotional and behavioral problems than typical readers.

Keywords: Behavioral problems; reading difficulty; reading disorder; SDQ; Thailand (Siriraj Med J 2022; 74: 509-517)

INTRODUCTION

Specific learning disorders (SLD) are neurodevelopmental irregularities that lead to learning ability impairments. The DSM V classifies SLD into three subtypes: 1) reading disorder; 2) writing disorder; 3) mathematics disorder.[1] Of all these, reading disorders (RD) are the most commonly recognized and intensively researched. Globally, the prevalence of SLD is 5–15% among school-age children across different languages and cultures. RD is the most common subtype of SLD; which accounts for 82% of total children with SLD or approximately 4 – 9 % of the population.[1,2] The prevalence rate of SLD in Thailand is in line with international research, the prevalence being between 6.4 - 15.6 %.[3-6] However, for prevalence studies in Thailand, it is necessary to explain that, in Thailand, there is currently no standardized comprehensive testing using Thai language to diagnose RD in children. The most widely used tool for diagnosis of RD is the Wide Range Achievement Test (WRAT)-Thai version which examines the accuracy of word reading, but does not measure other aspects such as fluency.[7]

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Received 15 November 2021 Revised 1 June 2022 Accepted 2 June 2022
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http://dx.doi.org/10.33192/Smj.2022.61

During the early elementary school years, children with RD have difficulties with spelling and reading aloud; they read slowly, guessing at or sounding out words they do not know, and making many errors. Reading skill is an essential prerequisite for academic success. Therefore, children with reading difficulties find challenges when they enter school. Not only do they achieve less academically than their peers, but their emotional and social lives are negatively impacted as well.

There is substantial literature on associations between reading difficulties and aspects of socio-emotional functioning. Research focusing on relationships between RD and internalized problems reveals that RD is associated with increased internalizing symptoms i.e., anxiety, depression, low self-esteem, somatic compliance and social withdrawal.[8-14] These symptoms were found in children from primary school to adolescence.[11] Children with RD also experience more externalizing symptoms. They are more overactive, impulsive, disruptive, defiant or aggressive than their peers who are typical readers. Moreover, reading problems were found to be associated with attention deficit hyperactive disorder (ADHD), oppositional defiant disorder (ODD), and conduct disorder. Among developmental disorders, ADHD is the most common comorbidity in children with RD; 15-40% of children with RD, also have ADHD.[8-10,12,15,16] In Thailand, research studies on the relationship between reading problems and behavior problems are limited. A study conducted an overview of medical records from 213 patients and found that 3 common developmental and emotional comorbid problems of SLD were ADHD (67.5%), developmental coordination disorder (27.2%) and adjustment disorders (14.6%).[5] However, the study was hospital-based where children with RD often had serious problems or had co-morbidities.

Although studies show associations between RD and both internalized and externalized behavior problems, there are no clear conclusions that such behavioral problems are the result of RD, or co-occurring with RD; one cognitive deficit may underlie both RD and several symptomatic behaviors.[17] A longitudinal study proposed that reading difficulties and problem behaviors appear to be independent of each other rather than problem behaviors being a consequence of reading failure supported a bidirectional causal model between reading and behavior problems.[12,18] Another longitudinal study followed a cohort of children in the UK from 2000 and found that children with specific word reading difficulties (SWRD) had behavioral challenges measured by SDQ at age 7, at the time they were just starting school. The researcher followed up this group of children for 4 years and found children with SWRD had even greater behavioral difficulties at 11 years old.[19]

Compulsory education of Thailand begins at Primary 1, corresponding to the age of 6-7 years. Systematic teaching of literacy begins when children are enrolled in this compulsory education. At present, in Thailand, RD has not been systematically screened in primary schools to provide early assistance. Therefore, children with RD who did not show any severe symptoms did not often receive service at hospital. This group of children not only needs help with reading and writing skills, but they may have emotional and behavioral issues that should be helped as well. Consequently, we were interested in a population-based study at a school. We wanted to find the prevalence and details of behavioral problems of children with or at risk of reading difficulties in their first years of school. Accordingly, the purpose of this study is to examine behavioral problems in grade 1 students at risk of RD as compared to those not at risk.

MATERIALS AND METHODS

A cross-sectional study was conducted in Pathum Thani Province, Thailand. Pathumthani is located adjacent to the Bangkok Metropolitan Region, with approximately 1.2 million people, who work in a variety of sectors including agriculture, industry, and other services. The Grade 1 students, aged 6 - 8 years, were recruited from eight primary schools in the region by purposive sampling. Schools were selected from three main affiliations: the Office of Basic Education Commission (OBEC), the Local Government Organization (LGO), and the Office of Private Education Commission (OPEC). The population selection from each school was done by distributing the number of students corresponding to each school's affiliation. In Pathum Thani province, approximately 70 % were affiliated with OBEC or LGO, and 30 % were affiliated with OPEC.[20] We decided to conduct this study during the second semester of grade one (November to December, 2018) because the data of our previous research found that children's reading ability in the first semester has an irregular distribution due to the wide variation in reading instruction in kindergarten. In the second semester of the compulsory school system, the 10th percentile cut-off point could be accurate enough to identify children with reading difficulty. Students previously diagnosed with visual impairment, e.g., blindness or low vision; hearing impairments, e.g., deafness; developmental disorders, e.g., autism, intellectual disabilities; and students who did not use Thai as a primary language were excluded.

Demographic data

Demographic data were collected by self-administrated questionnaire. The information collected includes age, gender, parental education, family income, kindergarten attendance, history of speech delay, family history of reading or writing difficulty, and parental perception of their children's reading abilities.

Assessment of reading skills

The students had their reading skills assessed by a test that was developed by Vibulpatanavong & Evans.[21] The reading tests were specifically designed for Thai students, grades 1-3. Word reading and passage reading tests were used in this study. The word reading test consisted of 60 words in a sequence from easy to difficult. Each student was instructed to read the words as quickly and accurately as possible in one minute in front of an assessor. The assessor gave a score based on the correct words that the child could read in one minute. The passage reading test comprised of three prose-style short stories, each 120 – 175 words long. Each student read aloud each story within one minute and was then scored on the basis of correct reading; each story was scored separately. The total score of the passage reading test was the sum of each passage score. The criteria for students at risk of RD was defined as having a score < 10 percentile of the sampled population in either the word reading test or in the passage section.

Assessment of behavioral problems

The assessment of behavioral problems was carried out using the Strengths and Difficulties Questionnaire (SDQ), Thai version for parents and teachers. The SDQ was designed for assessing children aged 4 - 16 years. It is comprised of 25 questions, which are divided into five subscales of five items each: 1) emotional symptoms, 2) hyperactivity/inattention, 3) conduct problems, 4) peer relationship problems, and 5) prosocial behavior. Each question of the SDQ can be answered as: not true (score of 0), somewhat true (score of 1), and certainly true (score of 2). On the first four subscales, higher scores represent more difficulties, while higher scores in the prosocial subscale indicate greater strengths.[22] The SDQ-Thai version was last updated in 2003 by Wongpiromsarn et al. Normative scores for Thai children were studied and cut off points were defined to classify children into 3 groups: normal, borderline, or problematic. SDQ was found to have high internal consistency. Cronbach's alpha for teacher and parent versions were 0.76 and 0.81, respectively.[23]

Procedures

After parental consent was given, reading assessment was performed face-to-face at school. Students had to read words and passages to the researchers one by one in a room with minimal noise. For consistency, each reading test (word, passage 1, passage 2 and passage 3) was assessed and scored by the same researcher for all children. Demographic questionnaires and the SDQ parental version were sent out to be completed by parents. The SDQ teacher versions were completed by homeroom teachers within two weeks. The reading scores were not disclosed to teachers and parents until the questionnaires were returned.

Data analysis

Data were analyzed by using STATA version14. Descriptive statistics were used, and when categorical data percentages were needed, normal distribution with mean and standard deviation were calculated for continuous data after being tested for data distribution. In comparison of data between groups, Chi square/Fisher exact tests were used for categorical data, whereas t-test/Mann-Whitney U tests were deployed for continuous data. Multivariate logistic regression model of the association between each behavioral problem and at risk of RD included gender, parental education, average family income, kindergarten school attendance, and school affiliation.

Ethical approval

Ethical approval was granted by the Human Research Ethics Committee of Thammasat University Faculty of Medicine: project number MTU-EC-PE-4-111/19.

RESULTS

Among the total of 1,127 students being sampled, 109 students were absent from the reading assessment; therefore, there were 1,018 questionnaires to be completed by parents and teachers, from which 902 sets, or 88.6 %, were returned.

According to our reading test, 132 students could be classified as at risk of RD. One student was excluded having a tested intelligence level ≤ 70; thus, the final number was 131 students, or 14.5 %.

The demographic data of students and their parents as shown in Table 1 reveals statistically significant differences of various external factors in students at risk of RD as compared to the normal group, i.e. three times males than females, parental education less than vocational college, below average family income, less attendance at kindergarten, and history of delayed speech. Although

TABLE 1. Demographic data of students at risk of RD compared to typical readers.

	At risk of RD N(%)	Typical reader N(%)	*P*-value
Gender			<0.001
Female	32 (24.4)	414 (53.8)	
Male	99 (75.6)	356 (46.2)	
Age: mean ± SD	7.0 ± 0.6	7.0 ± 0.4	0.786
Maternal education			0.023
High school or lower	94 (78.3)	498 (68.0)	
Vocational college or higher	26 (21.7)	234 (32.0)	
Father education			0.011
High school or lower	91 (79.1)	477 (67.4)	
Vocational college or higher	24 (20.9)	231 (32.6)	
Average family income per month (baht)			0.006
<10000	42 (34.7)	149 (20.4)	
10000 - 30000	58 (47.9)	387 (53.1)	
30000 - 50000	13 (10.7)	131 (18.0)	
50000 - 100000	5 (4.1)	49 (6.7)	
Kindergarten school			0.043
Attend	122 (96.8)	732 (99.1)	
Not attend	3 (2.4)	3 (0.4)	
History of delayed speech			<0.001
No	98 (86.7)	662 (95.7)	
Yes	15 (13.3)	30 (4.3)	
Family history of reading or writing difficulty: N (%)			0.178
No	102 (93.6)	685 (96.5)	
Yes	7 (6.4)	25 (3.5)	
Parent's perception of their child's reading ability			<0.001
Inferior	41 (44.1)	63 (9.7)	
Normal	51 (54.8)	542 (83.8)	
Superior	1 (1.1)	42 (6.5)	
School affiliation			<0.001
Office of Basic Education Commission	71 (54.2)	283 (36.6)	
Local Government Organization	34 (26.0)	220 (28.6)	
Office of the Private Education Commission	26 (19.8)	267 (34.7)	

parents of students at risk of RD were more aware of their children's reading difficulties than parents of typical readers, less than half of the parents realized that their children were less skilled at reading than their peers. Each school affiliation revealed a different proportion of children at risk of RD. The highest proportions of students at risk of RD were found in the OBEC, LGO, OPEC, respectively. Unexpectedly, a family history of reading or writing difficulty appeared not to affect reading skills in our study.

Table 2 shows the SDQ reported by parents and teachers, classified as problematic and non-problematic in students at risk of RD compared to typical readers. Both parental and teacher reports revealed that the proportions of student who had problematic behaviors were significantly higher in children at risk of RD than in typical readers in almost every domain of SDQ except for parentally-reported prosocial behavior. Thus, it can be concluded that overall behavioral problems are more pronounced in students at risk of RD than in typical readers.

With the use of univariate and multivariate analyses, the determined odds ratios of being at risk of RD for various behavioral domains of SDQ, reported by parents and teachers, are compiled in Table 3. The unadjusted odd ratios revealed that children at risk of RD were

TABLE 2. Number of students at risk of reading disorders whose SDQ scores were classified as problematic in various domains of behavioral problems compared to normal readers.

Domains	Classification	At risk of RD N (%)	Typical reader N (%)	*P*-value
Parent report				
Emotional problem	Normal/borderline	101 (77.1)	648 (84.2)	0.046
	Problematic	30 (22.9)	122 (15.8)	
Conduct problem	Normal/borderline	91 (69.5)	622 (80.8)	0.003
	Problematic	40 (30.5)	148 (19.2)	
Hyperactivity	Normal/borderline	96 (73.3)	658 (85.4)	<0.001
	Problematic	35 (26.7)	112 (14.6)	
Peer problem	Normal/borderline	50 (38.2)	400 (52.0)	0.004
	Problematic	81 (61.8)	370 (48.0)	
Prosocial behavior	Normal/borderline	122 (93.1)	739 (96.0)	0.144
	Problematic	9 (6.9)	31 (4.0)	
Total	Normal/borderline	85 (65.0)	614 (79.7)	<0.001
	Problematic	46 (35.1)	156 (20.3)	
Teacher report				
Emotional problem	Normal/borderline	112 (85.5)	732 (95.1)	<0.001
	Problematic	19 (14.5)	38 (4.9)	
Conduct problem	Normal/borderline	107 (81.7)	706 (91.7)	<0.001
	Problematic	24 (18.3)	64 (8.3)	
Hyperactivity	Normal/borderline	88 (67.2)	691 (89.7)	<0.001
	Problematic	43 (32.8)	79 (10.3)	
Peer problem	Normal/borderline	108 (82.4)	736 (95.6)	<0.001
	Problematic	23 (17.6)	34 (4.4)	
Prosocial behavior	Normal/borderline	97 (74.1)	701 (91.0)	<0.001
	Problematic	34 (25.9)	69 (9.0)	
Total	Normal/borderline	86 (65.7)	702 (91.2)	<0.001
	Problematic	45 (34.3)	68 (8.8)	

TABLE 3. Univariate and multivariate analysis of students at risk of reading disorders as a risk factors leading to behavioral problems.

Behavioral problem	Crude Odds ratio		Adjusted Odds ratio*	
	Odds ratio (95 % CI)	*P*-value	Odds ratio (95 % CI)	*P*-value
Parent report				
Emotional problem	1.57 (1.00 - 2.48)	0.048	1.66 (1.00 - 2.76)	0.049
Conduct problem	1.86 (1.23 - 2.81)	0.003	1.76 (1.08 - 2.85)	0.021
Hyperactivity	2.16 (1.40 - 3.35)	0.001	1.82 (1.09 - 3.05)	0.022
Peer problem	1.75 (1.20 - 2.56)	0.004	1.70 (1.11 - 2.60)	0.015
Prosocial behavior	1.80 (0.84 - 3.89)	0.132	1.19 (0.47 - 3.08)	0.706
Total	2.16 (1.45 - 3.22)	<0.001	2.37 (1.50 - 3.74)	<0.001
Teacher report				
Emotional problem	3.24 (1.80 - 5.82)	<0.001	4.05 (1.09 - 8.62)	<0.001
Conduct problem	2.53 (1.52 - 4.24)	<0.001	2.17 (1.19 - 3.95)	0.011
Hyperactivity	4.36 (2.82 - 6.72)	<0.001	4.47 (2.66 - 7.54)	<0.001
Peer problem	4.71 (2.66 - 8.33)	<0.001	4.90 (2.51 - 9.58)	<0.001
Prosocial behavior	3.58 (2.25 - 5.70)	<0.001	3.78 (2.19 - 6.48)	<0.001
Total	5.53 (3.56 - 8.59)	<0.001	5.32 (3.17 - 8.93)	<0.001

* Multivariate logistic regression model of the association between each behavioral problem and at risk of RD included gender, parental education, average family income, kindergarten school attendance and school affiliation.

likely to have more behavioral problems in all domains according to teacher reports and in conduct problem, hyperactivity and peer problem according to parental reports. Multivariate analysis was used to adjust for gender, parental education, average family income, kindergarten school attendance, and school affiliation. SDQ reports from teachers clearly indicated that even after adjustment, students at risk of RD still exhibited more behavioral problems in all domains than the other group. While SDQ reports from parents revealed the same results both before and after adjustment, children with RD were likely to display more conduct problems, hyperactivity and peer problems.

DISCUSSION

As far as we know, our study presents the first data on the prevalence of behavioral problems of Thai children at risk of RD from an early grade of school in school setting. The outcome of our research is consistent with the global findings. In our study, the SDQ scores from both parents and teachers revealed that children at risk of RD had more behavioral difficulties in almost all domains than children with typical reading skills.

The emotional problems domain from the SDQ questionnaire asked about internalizing symptoms, including somatic symptoms, anxiety, depressed mood, and self-esteem issues. Our study found that children in the at-risk group had significantly more of these problems than their peers. Teachers reported three times more internalizing problems while parents reported 1.7 times more problems in children at risk of RD. Similarly, previous research worldwide has found that at all ages; individuals with dyslexia have more internalizing symptoms, including higher level of depressive symptoms, lower level of self-esteem, and higher social and school anxiety.[8,11,24] The internalizing symptoms may be caused by feelings of incompetence and being pressured from adults. Children with reading difficulties attend school with the same willingness to learn to read as other children. However, over time, the children find themselves unable to read like their peers despite their efforts, and could not figure out what caused it, which

can lead to self-esteem problems. In addition, children are often under pressure from adults, such as teachers and parents who expect them to be successful in school. In early elementary year, it is the time when children go to school and learn to read. When parents find that their children are unable to read, they often link to their children's failure at school and tend to be anxious. They may blame the children for being inattentive and lazy due to a lack of understanding, which can exacerbate self-esteem problems and also internalizing symptoms. A previous study in Thailand found that although most parents of children with SLD had typical stress level, stress level was related with avoidance coping style.[25] Therefore, helping parents to understand and accept their children's difficulties could be beneficial for both parents and children.

For conduct problems, or externalizing symptoms, including often losing their temper, disobedience, fighting, lying, and stealing, both teachers and parents also reported significantly more challenges in children at risk of RD. These problems occurred about twice as much in at-risk children as in typical readers. Many international studies have also found that reading disabilities are associated with more externalizing symptoms, such as conduct, delinquency, and aggressive behaviors in children with reading disabilities.[8,14,26-27] Children with reading difficulties, when entering elementary school which focuses on reading and writing practice, often have trouble keeping up in class and may display task-avoidance behavior, such as ignoring teacher's instruction in the classroom, not working on assignments, and not handing in the assignments. If teachers or parents do not understand root causes of the problems, these behaviors may be interpreted as disobedience, lying, or resisting, which are described as externalizing symptoms. This avoidance behavior may also result in receiving negative feedback, such as scolding and punishment, which will intensify children's aggressive behaviors and externalizing symptoms.

Although both the questionnaires from teachers and parents reflected that at-risk children were more likely to have both internalizing and externalizing behavioral problems, the problems were more evident at school. It is worth noting that parents actually reported more children at risk with problems, but they also reported more problems in the not-at-risk children. It may be that at home, although there were more problems, the problems were unrelated to academics, while at schools; the behavioral problems were associated with learning situations.

On the Ages and Stages Questionnaire (ASQ) teachers reported problems among at-risk children most frequently in the hyperactivity domain. 32% of at-risk children had symptoms of attention deficit, hyperactivity or impulsivity while only 10% of typical readers had these problems. Epidemiological studies have consistently found that attention deficit hyperactivity disorder (ADHD) is the most common disorder co-occurring with dyslexia.[10,12,14,24] It is estimated that 15–40% of children with dyslexia are also diagnosed with ADHD. To date, it is not clear, on which exact functional processes this comorbidity is based. Some researchers proposed that children with reading difficulties struggle in learning in a classroom, and can lead to symptoms of ADHD, while some suggested that comorbid RD and ADHD was associated with a combination of the cognitive impairments according to brain function abnormalities, which are the underlying cause of both SLD and ADHD.

Deficient social skills, peer rejection and social isolation are known to accompany learning disabilities across age groups.[24,28-31] We also found this to be true, and we discovered that peer problems began to arise from the beginning of school. Social problems were especially evident in classrooms, where teachers reported five times more peer problems in children with reading difficulties than in typical readers. Problems with friends can be explained in a number of ways: RD may correlate with weakness in social interaction which causes peer problems.[12,24] Externalizing behaviors, self-regulation problems, and ADHD symptoms which are also common in children with RD may causes problems. It is interesting that the peer problem was the aspect that parents of children in both groups reported the most trouble with; fifty percent in the normal reader group and 60% in the at-risk group. This research was unable to explain why many parents were concerned about peer issues. More in-depth information should be gathered about parental concern of peer problems.

Parent and teacher reports differed regarding prosocial skills. Parents considered more than 90 percent of children in both groups to have good prosocial skills, but teachers rated the skills of at-risk children much lower than the prosocial skills of typical readers. This may be because the assessment of teachers was mostly based on behavior in the classroom. In Thailand, teachers usually have little opportunity to follow and observe students outside the classroom. Therefore, children at risk of RD who were inferior to their peers in education and faced more stress in the classroom had less opportunity to demonstrate prosocial skills, such as helping their classmates.

This research was a cross sectional study of the relationship between behavioral problems and reading

problems, so it was not possible to determine cause and effect. When the study was conducted, the children had just completed one semester of literacy training, about four months, which was too short to infer that reading problems lead to behavioral problems or vice versa. Previous research also found that children with reading difficulties had behavioral challenges shortly after starting school.[19,27] We therefore believe that emotional and behavioral problems and reading problems may be coincidental. As we know, reading problems and emotional problems can result from atypical brain functions. The abnormal brain activity of reading and emotional problems may be linked, this theory requires further study for clarification.

Previous research has revealed that without any intervention, behavioral and emotional problems worsen as a child with RD gets older.[24,30] Our study found that children with reading difficulty started having emotional and behavioral challenges shortly after attending primary school and were clearly different from general children. Thus, early intervention is essential, not only for reading impairment but also for emotional and behavioral issues for children who struggle with reading.

Our research entails some limitations. First of all, the measurements of emotional and behavioral problems were based on teachers' and parents' questionnaires which had unavoidable subjective bias. Secondly, the study took place only in Pathum Thani province, so the results may not be generalizable to the rest of Thailand. Lastly, there is currently no standard national reading assessment in Thai to determine if a child has a reading disorder (RD). We used a pre-existing test to assess reading skills and defined our at-risk group as the ten percent of students with the lowest scores. An ongoing long-term research study should learn how children in the at-risk group develop their reading skills in the future.

CONCLUSION

Students at risk of RD had more behavioral and emotional problems than children with no risk of RD, based on parental and teacher SDQ reports. The behavioral problems were more frequent in at risk RD students with the adjusted odds ratio of 1.6-4.7 according to both of teachers' and parents' reports. The major challenge reported by teachers was hyperactivity while peer problems were most often reported by parents.

ACKNOWLEDGEMENTS

This study was funded by The National Science and Technology Development Agency, Ministry of Higher Education, Science, Research and Innovation, Thailand, Thai Clinical Trial Registry: TCTR20191009001. We are greatly indebted to the participating students and their parents for their generosity and patience. Appreciation is also extended to all directors and homeroom teachers of schools participating in this project.

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