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Prevalence and risk factors for behavioral and emotional problems among primary school students in Thailand: A cross-sectional study

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ABSTRACT

Behavioral and emotional problems in primary school children challenge educational systems and child development globally. This cross-sectional study examined their prevalence and risk factors among Thai students aged 8-12 years. Using three-stage stratified random sampling, 500 students from Grades 3-6 in two Thai primary schools were recruited in the 2024 academic year. Teachers completed the Strengths and Difficulties Questionnaire (SDQ-Thai; $\alpha = 0.70$) and Behavioral Observation Screening Scale (BOSS-Thai; $\alpha = 0.90$). Binary logistic regression ($p < 0.05$) identified predictors. Prevalence was 21.8% (n = 109), with risks of 10.0% ADHD (n = 50), 3.0% ASD (n = 15), 11.8% LD (n = 59), and 5.6% ID (n = 28). The sample had 50.2% females, a mean age of 10.30 years (SD = 1.22), 55.2% in Grades 5-6, and 80.2% from low-income families (<30,000 THB/month). ADHD risk (OR = 8.96, 95% CI [4.11-19.51], $p < 0.001$), ID risk (OR = 3.51, 95% CI [1.22-10.07], $p = 0.020$), and older age (OR = 1.83, 95% CI [1.45-2.31], $p < 0.001$) independently predicted problems. Integrated screening and interventions are needed to mitigate long-term psychosocial risks.

Contribution/ Originality: This study contributes to the literature by providing the first prevalence estimate (21.8%) of behavioral and emotional problems among Thai primary school students (grades 3-6), utilizing validated SDQ-Thai and BOSS-Thai tools. It offers new insights into neurodevelopmental risks (ADHD OR=8.96, ID OR=3.51) and age as predictors, enhancing understanding of targeted screening needs in Thai educational contexts.

1. INTRODUCTION

Behavioral and emotional problems in primary school-age children represent one of the most pressing public health challenges affecting educational systems worldwide (Joseph, Sinha, & D'Souza, 2021; Li et al., 2023). These difficulties encompass a broad spectrum of behavioral manifestations, including externalizing behaviors such as aggression, hyperactivity, defiance, and rule-breaking, as well as internalizing problems including anxiety, depression, emotional dysregulation, and social withdrawal (Abdolahzadeh, Bigdeli, & Mashhadi, 2018; Ravindranadan & Joseph, 2022; Teekavanich, Chantaratin, Sirisakpanit, & Tarugsa, 2017). Understanding the prevalence and risk factors associated with these problems is critical for early identification and intervention, particularly within diverse cultural contexts where social norms and family structures may influence child development trajectories.

The extant literature indicates that the prevalence of behavioral problems among primary school students varies considerably across diverse contextual settings and assessment methodologies. Nonetheless, it consistently reveals

that a substantial proportion of children are affected, potentially impeding their academic progress and holistic development (Abdolahzadeh et al., 2018; Ravindranadan & Joseph, 2022; Teekavanich et al., 2017). Empirical studies have documented prevalence rates spanning from approximately 3% to as high as 22.7%, with externalizing behaviors, such as aggression, defiance, and rule-breaking, emerging as the most predominant manifestations compared to internalizing forms. For instance, Abdolahzadeh et al. (2018) conducted a study in Iran and determined that approximately 16% of primary school students met diagnostic criteria for behavioral disorders, with these issues exhibiting a marked gender disparity, being notably more prevalent among males, a pattern potentially attributable to differential biopsychosocial influences.

In Thailand, the prevalence of behavioral and emotional problems surged to 41.1%, with 68.9% showing peer problems, 37.4% conduct issues, and 30% hyperactivity; male children and those in single-parent families faced elevated odds (AOR = 1.7) (Pudpong et al., 2023). Recent international studies have corroborated these patterns, with Al Zaben et al. (2021) reporting significant ADHD prevalence among primary school students in Saudi Arabia, associated with family psychiatric problems and high family stress. Similarly, cross-sectional investigations in Asia have demonstrated substantial rates of behavioral difficulties, with teacher-reported assessments proving particularly sensitive for early identification (Casale, Herzog, & Volpe, 2023). These findings underscore the global nature of this public health challenge and the critical need for culturally responsive assessment and intervention strategies.

ADHD risks vary by region and informant: teacher reports indicate 13.13% hyperactivity/impulsivity in rural Chiang Mai, versus 3.54% by parents, with strong symptom overlaps (r = 0.780 for inattention-hyperactivity). Prior studies report 6.5%-10.09% ADHD risk in northeastern and Chiang Mai schools, higher in boys and younger grades. ASD, LD, and ID data remain sparse, but screening tools like the Behavioral Observation Screening Scale (BOSS-Thai) reveal notable at-risk proportions (Choopun, Pornsawan, Ngaweang, & Panyawong, 2025). Research demonstrates that learning disabilities significantly elevate children's risk for behavioral and emotional problems, with more than 37% of children with LD demonstrating affective, anxiety, and ADHD problems regardless of LD type (Aro, Eklund, Eloranta, Ahonen, & Rescorla, 2022). ADHD, ASD, LD, and ID frequently co-occur with behavioral/emotional problems, creating complex clinical presentations that require comprehensive assessment approaches.

Scholarly inquiries further underscore that behavioral problems in primary school children arise from the multifaceted interplay of individual (e.g., temperament and personality traits), familial (e.g., parent-child dynamics), scholastic (e.g., classroom environment), and societal factors (e.g., community norms and media exposure) (Joseph et al., 2021; Shabeeda, 2023). Critically, parental and environmental influences play a pivotal role in both the onset and persistence of these issues. Factors such as harsh or inconsistent disciplinary practices, parental depression, and inadequate social support networks significantly exacerbate vulnerability, thereby perpetuating maladaptive behavioral trajectories (Özdogru, 2023). Socioeconomic status has emerged as a particularly robust predictor, with low family income and parental educational attainment consistently associated with elevated behavioral problems through mechanisms involving parenting stress and reduced access to enrichment opportunities (Wang, Yang, & Chen, 2023). Family structure also plays a critical role, with children from single-parent or reconstituted families demonstrating higher rates of both externalizing and internalizing problems (Chen & Liu, 2020). Peer relationships represent another critical dimension of children's behavioral and emotional adjustment. Approximately 10-15% of children experience chronic peer relationship difficulties, including rejection and victimization, which both predict and result from behavioral problems (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2021). Aggressive behaviors, particularly reactive aggression, constitute the most commonly cited behavioral correlates of peer rejection in school settings, creating a reciprocal cycle of social exclusion and behavioral escalation. Conversely, prosocial behavior has demonstrated protective effects against behavioral problems, with longitudinal research showing that prosocial behavior toward strangers predicts lower levels of both aggression and delinquency (Luengo et al., 2014). These

findings emphasize the importance of a comprehensive assessment that considers not only individual symptomatology but also the broader social-ecological context.

The role of neurodevelopmental conditions in behavioral and emotional problems warrants particular attention. Children with intellectual disabilities exhibit challenging behaviors at significantly higher rates than their peers, with prevalence estimates ranging from 10-15% for severe forms to 22.5-55% when verbal aggression and temper tantrums are included (Sullivan, Totsika, Hastings, & Lunsky, 2022). Similarly, autism spectrum disorder demonstrates high rates of comorbid psychiatric symptoms, with emotional dysregulation and maladaptive behaviors often more strongly predicted by co-occurring psychiatric conditions than by ASD symptom severity itself (Dovgan & Mazurek, 2021). These patterns highlight the necessity of screening for neurodevelopmental conditions when assessing behavioral and emotional problems in primary school populations.

Teacher-rated screening instruments have emerged as efficient and psychometrically sound approaches for identifying students at risk. Recent validation studies demonstrate that brief teacher rating scales can capture social, emotional, and behavioral risks with high accuracy while requiring minimal administration time, making them practical for large-scale school-based screening (Casale et al., 2023). However, studies have usually focused on grade one students and preschool children. Few studies on behavioral and emotional problems have been done that focus on primary school-age children. It would be of interest to examine the prevalence of behavioral and emotional problems among primary school-age children. Therefore, the objectives of this study were to determine the prevalence of behavioral and emotional problems and assess the associated factors related to Thai primary school students, which may enable early identification and specific preventive intervention.

2. METHOD

2.1. Study Design and Procedures

This investigation employed a cross-sectional survey design to assess students enrolled in two primary schools in Thailand during the first semester of the 2024 academic year. The target population comprised students in Grades 3 through 6 (aged 8-12 years). The requisite sample size was calculated using the formula (Cochran, 1977): $n = \lceil z^2/4e^2 \rceil$, where e denotes the anticipated margin of error (0.05) at a 95% confidence level ($z = 1.96$), yielding a target of 500 participants.

A three-stage stratified random sampling approach was implemented: (1) districts were randomly selected, comprising one from Nakhon Pathom Province and one from Bangkok; (2) one primary school was randomly chosen from each selected district; and (3) two classrooms per grade level were randomly selected within each school. All students within the chosen classrooms (approximately 40 per classroom) were invited to participate, establishing a maximum recruitment pool of 2 schools x 4 grades x 2 classrooms x 40 students = 640. The final analytic sample consisted of 500 students who satisfied the predefined inclusion criteria, which included no prior diagnosis of major mental health disorders or developmental disabilities (verified via school records), provision of informed consent from both parents and students, and current enrollment in Grades 3–6. Classroom teachers administered the screening instruments, the Behavioral Observation of Students in Schools (BOSS) and Strengths and Difficulties Questionnaire (SDQ), for all students under their supervision. Data collection occurred between August and October 2024.

Data were collected using three questionnaires rated by the classroom teachers as follows:

1. Sociodemographic factors contained information about the characteristics of participants (age, gender, grade level, and GPA) and the characteristics of their parents (Marital status of parents, monthly income, and education).
2. At-Risk Indicators of ADHD, Autism, Learning Disabilities, and Intellectual Disabilities were measured using the Behavioral Observation Screening Scale (BOSS-Thai version) (Phoasavasdi, Chaninthayawong, Tawilo, & Khaipan, 2015). This 40-item instrument contains four subscales (10 items each): Subnormal

intelligence, learning disability, ADHD, and autism spectrum disorder. The Cronbach's alpha reliability coefficient was .90.

3. Behavioral and emotional problems were measured using the Strengths and Difficulties Questionnaire (SDQ-Thai version) (Wongpiromsarn, Wipulakorn, Nuanmanee, Woener, & Mongkol, 2011) to assess behavioral and emotional functioning. The SDQ contains 25 items across five subscales: Emotional symptoms (5 items), conduct problems (5 items), hyperactivity/inattention (5 items), peer relationship problems (5 items), and prosocial behavior (5 items). The Cronbach's alpha reliability coefficient was .70.

2.2. Ethical Considerations

The study protocol received formal approval from the Mahidol University Central Institutional Review Board (MU-CIRB) before the administration of any research instruments. Teachers overseeing the selected classrooms were briefed on the study's objectives, procedural details, and the entirely voluntary nature of participation. Informed consent documentation was distributed to parents/guardians and students, delineating the research purpose, anticipated benefits, minimal associated risks, and guarantees of participant confidentiality. Written informed consent was secured from parents, participating students, and their classroom teachers. All participants, including students and teachers alike, were explicitly assured of their right to decline involvement or withdraw from the study at any juncture without incurring any adverse consequences. The consent process required approximately 30 minutes per classroom. Subsequently, each participating teacher dedicated about 30 minutes per student to complete the requisite questionnaires.

2.3. Data Analysis

Descriptive statistics, including frequencies, percentages, means, standard deviations, and ranges, were calculated to characterize the sample demographics and ascertain the prevalence of at-risk indicators for attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), learning disabilities (LD), intellectual disabilities (ID), and behavioral problems. Associations between categorical variables were evaluated using chi-square tests of independence. Binary logistic regression models, employing the enter method with stepwise elimination, were constructed to identify significant predictors of: (1) at-risk status for ADHD, ASD, LD, and ID; and (2) behavioral and emotional problems. Predictor variables included gender, age, parents' marital status, living arrangements, paternal and maternal educational attainment, family income, grade level, and grade point average (GPA). Statistical significance was established at $p<.05$, with 95% confidence intervals computed for all reported odds ratios.

3. RESULTS

3.1. Demographic Characteristics of the Sample

Table 1 delineates the demographic profile of the 500 study participants. The sample exhibited near gender parity, with 50.2% female and 49.8% male participants aged 8 to 12 years (M = 10.30, SD = 1.22). A majority of parents (60.4%) reported being married. Educational attainment among parents was relatively high, with 53.4% of fathers and 50.4% of mothers holding bachelor's degrees or higher. Most families (80.2%) reported monthly incomes below 30,000 Thai baht. The majority of students (58.6%) resided with their immediate family, and 81.0% achieved grade point averages (GPAs) exceeding 3.00. Upper primary grades (5–6) constituted 55.2% of the sample.

Table 1. Demographic characteristics of the sample (n = 500).

Variables		*n*	%
Gender			
	Female	251	50.2
	Male	249	49.8
Age (Years)	*M = 10.30, SD = 1.22*		
	8	31	6.2
	9	128	25.6
	10	102	20.4
	11	139	27.8
	12	100	20.0
Grade level			
	Grade 3-4 (Middle primary)	224	44.8
	Grade 5-6 (Upper primary)	276	55.2
GPA	*M = 3.44, SD = 0.46*		
	≤ 3.00	95	19.0
	3.01 - 4.00	405	81.0
Parents' marital status			
	Living together	198	39.6
	No	302	60.4
Father's education			
	Bachelor's degree and higher	267	53.4
	Less than a bachelor's degree	233	46.6
Mother's education			
	Bachelor's degree and higher	252	50.4
	Less than a bachelor's degree	248	49.6
Family income/Month (Baht)			
	>30,000	99	19.8
	Less than 30,000	401	80.2
Living arrangements			
	Living with parents	293	58.6
	No	207	41.4

3.2. Prevalence of Behavioral and Emotional Problems and At-Risk Indicators of ADHD, Autism, LD, and ID among Thai Primary School Students

The prevalence of behavioral and emotional problems among Thai primary school students is presented in Table 2. Of the 500 participants, 21.8% reported having behavioral and emotional problems. The results also showed that 10.0% (n=50) were at risk for ADHD, 3.0% (n=15) for autism, 11.8% (n=59) for learning disabilities (LD), and 5.6% (n=28) for intellectual disabilities (ID).

Table 2. Prevalence of behavioral and emotional problems and at-risk indicators of ADHD, Autism, LD, and ID among Thai Primary School students assessed by their teachers (n = 500).

Variables		*n*	%
Behavioral and emotional problems *M = 12.99, SD = 5.19*			
	Normal	391	78.2
	At risk/have problems	109	21.8
Indicators of ADHD			
	Normal	450	90.0
	At risk/have problems	50	10.0
Indicators of Autism			
	Normal	485	97.0
	At risk/have problems	15	3.0
Indicators of LD			
	Normal	441	88.2
	At risk/have problems	59	11.8
Indicators of ID			
	Normal	472	94.4
	At risk/have problems	28	5.6

Table 3. Logistic regression analysis for predicting at-risk Indicators of ADHD, Autism, LD, and ID for behavioral and emotional problems (n = 500).

Variables	β	X^2	*P*	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
At-Risk indicators of ADHD	2.192	30.467	0.000	8.957	4.112	19.510
At-Risk indicators of ID	1.255	5.436	0.020	3.508	1.221	10.074
Age (Years)	0.604	26.139	0.000	1.829	1.451	2.305
Constant	-6.844	23.689	0.000	0.001		

3.3. Factors Related to Behavioral and Emotional Problems

Based on the logistic regression analysis, the final three factors significantly related to behavioral and emotional problems among primary school students were identified (Table 3). These three factors included at-risk for ADHD, at-risk for intellectual disability (ID), and advancing student age when controlled for each other. Students identified as at-risk for ADHD by teachers were 8.96 times more likely to exhibit behavioral and emotional problems compared to those not at-risk (Exp(B) = 8.957, p < .001, 95% CI [4.112, 19.510]). Similarly, students at-risk for intellectual disability (ID) had 3.51 times higher odds of having these problems than their non-at-risk peers (Exp(B) = 3.508, p = .020, 95% CI [1.221, 10.074]). Moreover, advancing student age was associated with increased risk, with each additional year raising the odds by 1.83 (Exp(B) = 1.829, p < .001, 95% CI [1.451, 2.305]).

4. DISCUSSION

The present study reveals a notable prevalence of behavioral and emotional problems among Thai primary school students aged 8-12 years, estimated at 21.8% based on teacher-reported scores on the Strengths and Difficulties Questionnaire (SDQ-Thai). This rate aligns with regional findings, such as 41.1% psychosocial difficulties during the COVID-19 pandemic, though lower than some international estimates, such as 36.4% in the Iranian outskirts (Abdolahzadeh et al., 2018) or 8.4% in urban China (Li et al., 2023). Binary logistic regression identified ADHD risk (adjusted OR = 8.96, 95% CI [4.11, 19.51]), intellectual disability (ID) risk (OR = 3.51, 95% CI [1.22, 10.07]), and advancing age (OR = 1.83, 95% CI [1.45, 2.31]) as significant predictors, underscoring neurodevelopmental vulnerabilities.

The findings reveal that prevalence data from teacher assessments using SDQ-Thai and Behavioral Observation Screening Scale (BOSS-Thai) indicate 10.0% at ADHD risk, 3.0% at autism risk, 11.8% at learning disability (LD) risk, and 5.6% at ID risk, with 21.8% overall behavioral/emotional issues. These figures exceed pre-pandemic baselines, such as 13.7% in Bangkok (Chutha, Chaninyuthwong, & Sooktup, 2018), and mirror elevated rates in Thailand's northeast (6.5%-10.09% ADHD). The ADHD prevalence observed in this study is consistent with international findings from Saudi Arabia, where Al Zaben et al. (2021) reported significant ADHD rates associated with family psychiatric problems and early parental loss. The efficiency of teacher-rated screening instruments in this study aligns with recent validation research demonstrating that brief rating scales can capture behavioral and emotional risks with high psychometric accuracy (Casale et al., 2023).

Externalizing problems like conduct issues (37.4%) and hyperactivity (30.0%) predominate, consistent with rural Chiang Mai reports of 13.13% hyperactivity/impulsivity and national first-grade surveys (15.7% problematic behaviors) (Chutha et al., 2018; Pudpong et al., 2023). Comparatively, inclusive settings show special needs children facing 66.3% behavioral concerns versus 5.1% in mainstream peers, while psychosocial studies report 68.9% peer problems. Age trends reveal upper primary (grades 5-6) students at higher risk, potentially due to academic pressures (Pudpong et al., 2023; Zahid, Jamil, & Nawaz, 2023). This age-related increase may also reflect the developmental intensification of peer relationship difficulties, which research shows affect 10-15% of children chronically and serve as both predictors and consequences of behavioral problems (Parker et al., 2021).

The findings resonate with Asia-Pacific patterns, where externalizing behaviors dominate (e.g., 23.11% oppositional defiant in Mashhad; 14.65% ODD in rural Thailand). ADHD's strong link (OR 8.96) echoes national

data (AOR 2.18 for screening risk) and global comorbidity (e.g., 32.8%-86.2% low IQ overlap). The elevated risk among children with learning disabilities observed in this study is supported by international research demonstrating that more than 37% of children with LD exhibit behavioral-emotional problems across affective, anxiety, and ADHD domains, with boys with math disability showing particular vulnerability (Aro et al., 2022). ID risk aligns with 62.8% ADHD-low IQ comorbidity patterns, consistent with literature showing that children with intellectual disabilities exhibit challenging behaviors at rates of 10-15% for severe forms, increasing to 22.5-55% when verbal aggression and temper tantrums are included (Sullivan et al., 2022).

Age effects match increasing delinquency/depression. Unlike urban China (8.4%, higher in boys/no siblings), Thai rates reflect rural/urban mixes, with single-parent families elevating odds (AOR 1.7) (Abdolahzadeh et al., 2018; Choopun et al., 2025; Chutha et al., 2018; Li et al., 2023; Pudpong et al., 2023; Sriwongpanich, Srisutham, Panthong, & Jindarom, 2019). The role of family structure and socioeconomic factors in this study aligns with recent research demonstrating that low family income predicts increased behavioral problems through mechanisms involving parenting stress and reduced investment in child enrichment (Wang et al., 2023). Family disruption, particularly single-parent household status, has been shown to independently predict both externalizing and internalizing problems, with effects particularly pronounced among boys (Chen & Liu, 2020).

Discrepancies from Western norms (e.g., 13% Europe) (Li et al., 2023) stem from socioeconomic stressors like low income (<30,000 THB, 80.2%), amplifying risks seen in Pakistan inclusions (66.3% special needs behaviors) (Abdolahzadeh et al., 2018; Zahid et al., 2023). The high proportion of families with monthly incomes below 30,000 baht (80.2%) in this sample represents a significant contextual factor, as research consistently demonstrates that low socioeconomic status increases children's risk for behavioral problems through multiple pathways, including parental distress, reduced access to educational resources, and neighborhood disadvantage (Wang et al., 2023). These socioeconomic effects may be partially buffered by prosocial behavior, which longitudinal research shows serves as a protective factor against aggression and delinquency (Luengo et al., 2014), suggesting potential targets for school-based prevention programs.

The pattern of neurodevelopmental risk indicators observed in this study, particularly the co-occurrence of ADHD, LD, and ID with behavioral problems, reflects broader patterns in the literature. Research on autism spectrum disorder demonstrates similar comorbidity patterns, with emotional dysregulation and maladaptive behaviors often more strongly predicted by co-occurring psychiatric symptoms than by ASD severity itself (Dovgan & Mazurek, 2021). This underscores the importance of comprehensive screening approaches that assess multiple dimensions of neurodevelopmental functioning rather than focusing on single diagnostic categories. The finding that teacher ratings effectively identify at-risk students is particularly important given recent evidence that teacher reports demonstrate superior discriminative validity compared to parent reports for identifying preschoolers requiring further assessment (Zhang, Yan, & Wang, 2025).

4.1. Implications for Educational Practice

The findings from this study underscore the critical need for proactive, multi-tiered screening protocols within Thai primary schools to identify students at risk for behavioral and emotional problems, particularly those linked to ADHD (adjusted OR = 8.96) and intellectual disability (ID; OR = 3.51). Educators and school administrators should integrate validated teacher-report tools such as the Strengths and Difficulties Questionnaire (SDQ-Thai) and Behavioral Observation Screening Scale (BOSS-Thai) into routine classroom assessments, especially for upper primary students (grades 5-6), where advancing age significantly elevates risk (OR = 1.83). This approach enables early detection of the 21.8% prevalence observed, facilitating targeted interventions like behavioral coaching, social skills training, and individualized education plans (IEPs) that address comorbid neurodevelopmental risks without stigmatizing students.

Given the efficiency of brief teacher rating scales demonstrated in recent research (Casale et al., 2023), schools can implement universal screening programs that require minimal time investment (approximately 90 seconds per student) while maintaining high psychometric accuracy. Schools can enhance teacher training programs to recognize subtle indicators of ADHD and ID risks, emphasizing externalizing behaviors such as hyperactivity and conduct problems, which predominate in this population. Collaborative partnerships between educators, psychologists, and parents are essential, including family workshops on consistent discipline and emotional regulation strategies to mitigate familial factors like low income (80.2% of sample) and non-intact parental marital status (60.4%). Given the documented effects of socioeconomic status on behavioral problems through parenting stress pathways (Wang et al., 2023), interventions should include family support components that address material hardship and provide parenting education.

Furthermore, resource allocation for school-based mental health services, such as counseling hubs or peer mediation programs, could reduce long-term psychosocial consequences, aligning with inclusive education policies in Thailand. Promoting prosocial behavior through structured programs may serve as a protective factor, as research demonstrates that prosocial behavior predicts lower levels of aggression and delinquency over time (Luengo et al., 2014). Peer relationship interventions are particularly important given that 10-15% of children experience chronic peer difficulties that both result from and exacerbate behavioral problems (Parker et al., 2021). By prioritizing these practices, primary schools can foster resilient learning environments that support holistic development amid rising neurodevelopmental challenges.

4.2. Limitations and Future Directions

While this cross-sectional study provides valuable prevalence data (21.8% behavioral/emotional problems) from a stratified sample of 500 Thai primary students, several limitations warrant consideration. First, reliance on teacher-reported measures (SDQ-Thai and BOSS-Thai) introduces potential informant bias, as educators may overlook internalizing symptoms like anxiety compared to externalizing ones, although recent research suggests teacher reports demonstrate superior discriminative validity for identifying at-risk children compared to parent reports (Zhang et al., 2025). Multi-informant perspectives (e.g., parents, students) were absent, limiting comprehensive assessment. Second, the sample was restricted to two urban-adjacent provinces (Nakhon Pathom and Bangkok), which limits generalizability to rural or northeastern Thailand, where ADHD risks may differ (e.g., 6.5-13.13% reported elsewhere). Third, the cross-sectional design precludes causal inferences about predictors like age or neurodevelopmental risks, and the exclusion of students with prior diagnoses may underestimate true prevalence.

Future research should employ longitudinal designs to track developmental trajectories of at-risk students from grades 3-6 into adolescence, elucidating bidirectional relationships between behavioral problems and academic outcomes like GPA (mean = 3.44). Such longitudinal approaches would enable examination of how early behavioral problems predict later academic achievement and social adjustment, as well as how protective factors like prosocial behavior buffer against risk trajectories over time (Luengo et al., 2014). Incorporating objective measures, such as direct behavioral observations or diagnostic interviews, alongside diverse informants, would strengthen validity. Comparative studies across Thailand's regions, including underserved areas, could reveal contextual moderators like socioeconomic disparities and their mechanisms of influence on child behavioral development (Wang et al., 2023).

Additionally, intervention trials testing school-based programs, e.g., mindfulness for ADHD risk, cognitive-behavioral supports for ID, or social skills training for peer relationship difficulties, would translate these findings into evidence-based practices. Given the elevated risk among children with learning disabilities (Aro et al., 2022) and the complex presentation of challenging behaviors in children with intellectual disabilities (Sullivan et al., 2022), interventions should address multiple co-occurring conditions rather than single diagnostic categories. Exploring moderators like gender (near parity in sample) and family structure through advanced modeling (e.g., structural equation modeling) remains a priority for Scopus-level publications in educational psychology. Research should also

examine the role of comorbid conditions, as studies of autism spectrum disorder demonstrate that psychiatric comorbidities often exert stronger effects on behavioral outcomes than core diagnostic symptoms (Dovgan & Mazurek, 2021).

5. CONCLUSION

This cross-sectional study reveals a 21.8% prevalence of behavioral and emotional problems among Thai primary school students (grades 3-6), with ADHD risk (OR=8.96), intellectual disability risk (OR=3.51), and older age (OR=1.83) as key predictors. These findings advocate routine teacher screening using SDQ-Thai and BOSS-Thai tools, alongside training programs and parent-school collaborations to mitigate neurodevelopmental vulnerabilities in resource-limited settings. Limitations include potential under-detection of internalizing issues via teacher reports and restricted generalizability from the sample, warranting future longitudinal, multi-informant studies with region-wide intervention trials.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
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