

Knowledge of Attention Deficit Hyperactivity Disorder and Its Associated Factors among Teachers in 3 Large Primary Schools in Phra Nakorn Sri Ayutthaya Province, Thailand

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Background: Though attention deficit, hyperactivity disorder, ADHD is a common problem in childhood. Thai teachers' knowledge regarding the disease has never been assessed.

Objective: To identify knowledge of Thai teachers regarding ADHD and its influencing factors.

Material and Method: Cross-sectional study was operated in three primary schools in Ayutthaya, Thailand. Standardized questionnaires comprised of demographic data, ADHD experiences and the Knowledge of Attention Deficit Disorder Scale, KADDS, were distributed to participating teachers. Results were reported using frequency, percent, mean, and standard deviation. Association between demographic and ADHD experiences and the KADDS score was identified by logistic regression analysis.

Results: Lack of knowledge of ADHD among teachers was apparent. Only 19.4% of them passed the total scale of KADDS. Teachers under 31-years old were more likely to pass general information and signs, symptoms & diagnosis subscales and total scale. In addition, familiarity with ADHD patients was associated with passing scores of general information subscale and total scale.

Conclusion: Despite public awareness of ADHD, Thai teachers lacked knowledge concerning the disease. Young teachers were more acquainted with ADHD. Direct experience with ADHD patient might help teachers develop their knowledge on ADHD.

Keywords: ADHD, Teachers, Primary school, Knowledge, Associated factors, KADDS

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When children reach school age, school life is an important part of their life providing not only educations but also social milieu. In Thailand, children spend 2/3 of their daytime in school. Teachers gradually become their closest person apart from parents who can observe social interaction and report behavioral problems. Frequently, many diseases are diagnosed base on teachers' reports; one of them is attention deficit, hyperactivity disorder, ADHD⁽¹⁾.

Attention deficit, hyperactivity disorder, ADHD is one of the most common behavioral & developmental problems emerging during school age with prevalence of 6.5% of primary school students in

Thailand⁽²⁾. Due to difficulty in observing young children, ADHD is frequently diagnosed when the child attends school and exhibits compatible diagnostic symptoms such as inattention or compulsivity. To make a diagnosis of ADHD, it also requires the symptoms to be apparent in at least two different situations or places. Accordingly, teachers' observation of the child's behavior is crucial in diagnosing ADHD⁽³⁾.

Teachers' role in ADHD is not only in observation and referral of the suspected ADHD case, but also in collaborative management of the child's behavior in school e.g. preparing classroom environment to help the child focus on learning and guiding and helping the child complete his class work. Regarding these roles, teachers' knowledge of the disease is considered important in making holistic management possible for a child with ADHD⁽⁴⁾.

Though current recommendations of

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American Academy of Pediatrics emphasizes the importance of teachers' role in managing a child with ADHD⁽³⁾, studies in many countries irrespective of developmental status have demonstrated inadequacy of teachers' knowledge regarding the disease⁽⁵⁻¹¹⁾. These findings lead to strategic interventions finally improving knowledge of teachers on ADHD and successful introduction of a holistic management including home, hospital and school to the affected child.

To date, no studies of teachers' knowledge concerning ADHD, including all aspects of the disease e.g. pathogenesis, signs and symptoms, diagnosis and treatment, has ever been operated in Thailand. Accordingly, the present study was aimed primarily to provide a systematic assessment of knowledge regarding ADHD of Thai primary school teachers as well as identify associated factors that will help them develop comprehensive knowledge on the disease.

Material and Method

This cross-sectional study has been reviewed and approved by the Institutional Review Board of The Royal Thai Army Medical Department (Project No. R1129/55_Exp) to be undertaken in three large primary schools in Phra Nakorn Sri Ayutthaya province, Thailand. The selected schools had met the following criteria: situated in an urban area and had a student to teacher ratio of at least 25 to 1, making them comparable to each other. Study participants were teachers currently teaching in those schools. The calculated number of participants, including 10% dropout rate, was 196.

Information was collected during April and May 2013 using standardized questionnaires comprised of three sets of questions concerning demographic data, ADHD exposure and sources of knowledge regarding the disease and Thai version of the Knowledge of Attention Deficit Disorder Scale, KADDS (copyright granted by Scuitto MJ). The Knowledge of Attention Deficit Disorder Scale, KADDS was structurally designed to assess knowledge of ADHD in three aspects: general information subscale, signs/symptoms and diagnosis subscale, and treatment subscale. This Thai version of KADDS has been translated, tested, and revised before application in the present study. Passing score of this scale was 50% on each subscales as well as the total scale.

Statistical analysis

Data from the questionnaires were registered and analyzed anonymously using the STATA/MP 12.

Demographic data were presented as frequency, percent, mean and standard deviation, when applicable.

Identification of association between demographic data and ADHD exposures and sources of knowledge regarding the disease with score on the Knowledge of Attention Deficit Disorder Scale, KADDS was performed by univariate and multivariate logistic regression analyses. A *p*-value <0.05 was considered statistically significant.

Results

Study participants

Of 212 teachers currently working in three selected schools, 201 agreed to participate and were recruited into the present study. Eleven non-participants were teachers on sick leaves, vacation, or on duty outside school.

Among the 201 participants, 85.6% was female (Table 1). Mean age and median teaching experience in year were 45.01±12.36 and 25 (1-37), respectively. The majority (76.6%) gained bachelor's degrees as their highest education. The most frequent subject currently teaching was Thai, followed by mathematics and science (37.3%, 15.4% and 10.4%, respectively). Almost all of the participants were class instructor or subject instructor or both and were teaching grades 1 to grade 9.

ADHD exposure and sources of knowledge regarding ADHD

The majority of participants (83.6%) have never been taught about or trained on ADHD before graduating (Table 2). 59.7% of participant had taught or been teaching student(s) with physician-diagnosed ADHD. The three most frequent sources of knowledge regarding ADHD were television programs, textbooks, and leaflets. 46.8% were familiar with ADHD patients apart from their pupils.

The knowledge of attention deficit disorder scale (KADDS)

This Thai version of the knowledge of attention deficit disorder scale (KADDS) demonstrated high reliability with Cronbach's alpha of 0.91 comparing with its original study and recent study of 0.81 both^(6,8).

Concerning the passing score of 50% on each subscales and the total scale, most of the participants passed and scored higher on signs/symptoms and diagnosis subscale with 62.7% passers comparing to general information and treatment subscales (12.9% and 12.4% passers, respectively). Only 1/5 of

Table 1. Demographic characteristics of study participants

Characteristics (total n = 201)	
Age (years), (mean ± SD (range))	45.01±12.36 (21-62)
Years of teaching experiences, median (range)	20.13 (1-38)
Gender	n (%)
Male	29 (14.4)
Female	172 (85.6)
Highest degree	
Bachelor	154 (76.6)
Master	47 (23.4)
Most frequent teaching subject	
Thai	75 (37.3)
Mathematics	31 (15.4)
Social science	22 (10.9)
Science	21 (10.4)
Health and physical education	11 (5.5)
Art	7 (3.5)
Computer and technology	16 (8.0)
Foreign languages	18 (9.0)
Attended class	
Grade 1-3	80 (39.8)
Grade 4-6	81 (40.3)
Both grade 1-3 and 4-6	8 (4.0)
Junior high school	32 (15.9)
Position	
School administrator	3 (1.5)
Class instructor	56 (31.3)
Subject instructor	63 (27.9)
Both class and subject instructor	79 (39.3)

responders passed the total scale of KADDS (19.4%). Using univariate and multivariate logistic regression analyses, teachers who were no more than 30 years old were more likely to pass the total scale of KADDS (adjusted OR = 3.717, $p = 0.041$) as well as its general information and signs/symptoms and diagnosis subscales (adjusted OR = 8.454, $p = 0.042$ and adjusted OR = 2.972, $p = 0.004$, respectively) (Table 3).

Also, familiarity of ADHD patients apart from pupils was associated with higher chances to pass the general information subscale and the total scale with adjusted odds ratio of 4.474, $p = 0.002$ and 3.218, $p = 0.003$, respectively. Participants gaining their knowledge about ADHD from leaflets also had a higher chance to pass the signs/symptoms and diagnosis subscales (adjusted OR = 2.167, $p = 0.036$) and those gaining from researches and journals were more likely to pass the general information subscales (adjusted OR = 2.531, $p = 0.039$).

No association between any demographic data and ADHD exposure and sources of knowledge regarding the disease and the scores on the treatment

subscales of the Knowledge of Attention Deficit Disorder Scale, KADDS, was demonstrable.

Discussion

Attention Deficit, Hyperactivity Disorder, ADHD is one of the most common developmental and behavioral problems emerging during childhood worldwide and as well as in Thailand. It requires an effective collaboration of family, school, and health care providers to optimize the disease outcome⁽¹²⁾. Teachers play a major role both before and after the child was diagnosed with ADHD. During pre-diagnostic period, teachers are the closest and familiar person, apart from family members, who can report crucial information about a child's in-class behavior and refer him to be evaluated and diagnosed. Following the diagnosis, teachers are expected to help in managing ADHD pupils by adjusting classroom environment and delivering cognitive-behavioral therapy to promote self-control⁽¹³⁾. Unfortunately, Thai teachers' knowledge regarding ADHD has never been before assessed.

Table 2. Experiences Related to Attention Deficit Hyperactivity Disorder (ADHD) (n = 201)

Experiences (total n = 201)	n (%)
Learning about ADHD during teacher training	
Never	168 (83.6)
Briefly as part of selected subject	28 (13.9)
Subject focus mainly on the disease	5 (2.0)
Number of previously or currently taught physician-diagnosed ADHD student	
0	81 (40.3)
1-3	90 (44.8)
4-6	16 (8.0)
More than 6	14 (7.0)
Sources of knowledge on ADHD	
Conferences	
Never	179 (89.1)
At least once	22 (10.9)
Books	
Never	90 (44.8)
At least once	101 (55.2)
Published researches or journals	
Never	127 (63.2)
At least once	74 (36.8)
Leaflets	
Never	94 (48.8)
At least once	103 (51.2)
Television programs	
Never	79 (39.3)
At least once	122 (60.4)
Internet	
Never	142 (70.6)
At least once	59 (29.4)
Familiarity with ADHD patients outside school	
No	107 (53.2)
Yes	94 (46.8)

The present study provided the first systematic evaluation of knowledge of Thai teachers regarding ADHD by highly reliable and widely acknowledged measurement-the knowledge of attention deficit disorder scale (KADDS)^(8,9,14,15). Though the result indicated that Thai teachers were still lacked accurate knowledge of ADHD, they were better in the field of signs/symptoms and diagnosis of the disease than in general information and treatment. This result was consistent with its pioneer in 2000⁽⁵⁾, in South Texas in 2009⁽¹⁵⁾, in Romania in 2010⁽¹⁶⁾, and in Ohio in 2011⁽¹⁷⁾ reporting similar outcome with better knowledge in signs/symptoms and diagnosis subscale of the KADDS. Considering total scale, many studies with KADDS in other parts of the world such as in South Africa⁽⁹⁾ and Puerto Rico⁽¹⁴⁾ and in Asia such as in Iran⁽⁸⁾, Sri Lanka⁽¹⁸⁾, and South Korea⁽¹⁹⁾ demonstrated

inadequacy of teachers' knowledge on ADHD as well. Moreover, even with different measurements, teachers' lack of knowledge was still apparent. For example, studies in Israel in 2000⁽²⁰⁾ and in Australia in 2004⁽⁷⁾ also reported teachers' misconception and lack of knowledge concerning ADHD. The highest score of 77% mean knowledge was only demonstrated in the study in 1994 in Canada⁽⁵⁾. This might be because of there were only two answers, yes or no, provided in that scale, therefore, correct responses could arise from guessing. The KADDS had its advantage here because each item had three types of answer, yes, no and don't know, which helped discriminate lack of knowledge from misconception.

Concerning associated factors promoting higher knowledge of ADHD from the present study, younger teachers seemed to be more knowledgeable

Table 3. Factors associated with passing score on the general information, signs/symptoms & diagnosis, and treatment subscales and total scale of the knowledge of attention deficit hyperactivity disorder scale (K-ADDS)

Characteristics	Univariate analysis			Multivariate analysis		
	Crude OR	95% CI	p-value	Adjusted OR	95% CI	p-value
General Information of ADHD						
Age (up to 30 years old)*	7.407	0.973-56.383	0.053	8.454	1.078-66.265	0.042
Highest degree (master degree)	1.909	0.788-4.621	0.152			
Teaching experience (more than 10 years)	2.188	0.810-5.542	0.126			
Sources of ADHD knowledge						
Textbooks	1.895	0.783-4.588	0.157			
Published researches & journals*	2.548	1.103-5.890	0.029			
Leaflets	2.276	0.940-5.509	0.068			
Television programs	2.298	0.879-6.008	0.090	2.531	1.049-6.103	0.039
Familiarity with ADHD patients outside school*	4.550	1.741-11.866	0.002	4.474	1.677-11.934	0.002
Signs/Symptoms & Diagnosis of ADHD						
Age (up to 30 years old) *	2.768	1.369-5.596	0.005	2.972	1.414-6.249	0.004
Sex (female)	1.875	0.842-4.177	0.124			
Teaching experience (more than 10 years) *	1.792	0.978-3.284	0.059			
Sources of ADHD knowledge						
Conferences	2.785	0.915-8.479	0.142			
Textbooks*	2.421	1.323-4.429	0.004			
Leaflets*	2.773	1.501-5.122	0.001	2.167	1.053-4.460	0.036
Television programs*	2.864	1.544-5.245	0.001	1.992	0.975-4.068	0.059
Internet*	1.978	0.977-4.003	0.058			
Treatment of ADHD						
Sex (male)	2.101	0.760-5.809	0.153			
Courses taken before graduation	2.333	0.884-6.157	0.087			
Teaching experience (more than 10 years)	1.994	0.758-5.242	0.162			
Sources of ADHD knowledge						
Conferences*	2.609	0.928-7.338	0.069	2.554	0.892-7.315	0.081
Familiarity with ADHD patients outside school*	2.234	0.937-5.327	0.070	2.097	0.872-5.045	0.098
Total Scale of KADDS						
Age (up to 30 years old) *	3.677	1.027-12.614	0.038	3.717	1.058-13.065	0.041
Sources of ADHD knowledge						
Conferences	2.201	0.872-5.554	0.095			
Textbooks*	1.988	0.942-4.196	0.071	1.954	0.910-4.237	0.090
Published researches & journals	1.750	0.664-3.545	0.120			
Leaflets	1.830	0.888-3.777	0.101			
Familiarity with ADHD patients outside school*	3.190	1.509-6.743	0.002	3.218	1.500-6.905	0.003

* variables entering multivariate analysis

to ADHD in general information and signs/symptoms and diagnosis subscale as well as the total scale. This might be a result of the fact that although the disease was added to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders since 1980⁽²¹⁾, it has only become of public awareness in Thailand a couple of years ago. Accordingly, the younger generation of teachers has become more acquainted with the disease.

In addition, familiarity with ADHD patients apart from their pupils also helped teachers gain higher knowledge on the disease both in general information subscales and the total scale. This finding was reconciled with studies in Australia in 2004⁽⁷⁾ and in Florida in 2005⁽²²⁾ even though they used different scales for measurement. Printed media, namely, published researches/journals and leaflets concerning ADHD might be effective in introducing the disease to Thai teachers.

However, there were many studies reporting different outcomes. According to KADDS' pioneer in 2000⁽⁶⁾ and a study in South Africa in 2012⁽⁸⁾, both revealed that an overall knowledge on ADHD was related to teachers' self-efficacy and to their exposure to ADHD as a childhood disorder. In Sri Lanka⁽¹⁸⁾, knowledge on ADHD was interestingly associated with teachers' training in Child Psychology. On the contrary, some studies were not able to demonstrate relationship between participants' characteristics and ADHD experience to the knowledge scale^(7,15,23).

Conclusion

Primary school teachers in Thailand were still lacking in knowledge and held misconceptions concerning ADHD despite increase public awareness of the disease. Their deficits were mainly in general information of ADHD and its treatment. According to this study, the majority of participants reported that they had never been taught about or trained on ADHD before graduating; this suggested the need for integration of subjects or courses concerning ADHD into teaching school curriculum. Furthermore, the knowledge gap between generations of teachers was apparent, according to associations revealed in this study, necessitating continuing education. In addition, providing an opportunity to enhance experience with ADHD patients outside school setting might help improve teachers' knowledge of the disease. To dispense information regarding ADHD to teachers, printed media such as journals or leaflets might be the most effective.

Future study

To supply more information for tailoring strategic policy to improve teachers' knowledge on ADHD, a larger study including teachers in different settings such as urban versus suburban schools or government-run versus private schools or general education versus special education should be undertaken. Furthermore, to identify the most effective method to improve teachers' knowledge, an interventional study should be pursued. Finally, as ADHD can be diagnosed late to early adolescent (12 years old) according to the newly issued 5th edition of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association⁽²⁴⁾, study recruiting teachers in secondary school is recommended.

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Potential conflicts of interest

None.

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ความรู้ความเข้าใจและปัจจัยที่เกี่ยวข้องต่อความรู้ความเข้าใจเกี่ยวกับโรคสมาธิสั้นของครูในโรงเรียนประถมศึกษา 3 โรงเรียน
ในจังหวัดพระนครศรีอยุธยา

พงษ์ชนก เหมือนประสาท, ชาญชัย ไตรวารี, วิริงรอง อรัญนารณ, ชาศรีญา วีรินทร

ภูมิหลัง: โรคสมาธิสั้น (attention deficit/hyperactivity disorder (ADHD)) เป็นโรคทางพัฒนาการและพฤติกรรมเด็กที่พบบ่อยที่สุดแต่ในปัจจุบัน
ยังไม่มีการศึกษาความรู้ความเข้าใจเกี่ยวกับโรคนี้ในครูไทย

วัตถุประสงค์: รายงานนี้ศึกษาความรู้ความเข้าใจของครูไทยที่สอนในระดับประถมศึกษาต่อโรคสมาธิสั้น และปัจจัยที่เกี่ยวข้องกับการเกิดความรู้ดังกล่าว
วัตถุประสงค์และวิธีการ: งานวิจัยนี้เป็นการศึกษาแบบ cross-sectional โดยให้ครูในโรงเรียน 3 แห่งที่ทำการศึกษาคอบแบบสอบถามมาตรฐานที่ประกอบด้วย
ข้อคำถาม 3 ชุดได้แก่ ข้อมูลพื้นฐานของกลุ่มตัวอย่าง ข้อมูลประชากร และแหล่งที่มาของความรู้เกี่ยวกับโรคสมาธิสั้น และแบบประเมินความรู้
ความเข้าใจเกี่ยวกับโรคสมาธิสั้น ฉบับภาษาไทย ซึ่งทดสอบความรู้อันเกี่ยวข้องกับโรคสมาธิสั้น 3 ด้านคือ ข้อมูลทั่วไป อาการและการวินิจฉัย
และการรักษา การรายงานผลใช้สถิติ ความถี่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐานและใช้สถิติ univariate และ multivariate logistic regression
analysis ในการหาความสัมพันธ์ระหว่างข้อมูลทั่วไปและข้อมูลประชากร กับคะแนนจากแบบประเมินความรู้ความเข้าใจเกี่ยวกับโรคสมาธิสั้น
ผลการศึกษา: ผู้ร่วมวิจัยในครั้งนี้อย่างขาดความรู้ที่เกี่ยวข้องกับโรคสมาธิสั้น โดยมีผู้ผ่านแบบประเมินทั้งฉบับร้อยละ 19.4 กลุ่มตัวอย่างทำคะแนน
ในส่วนอาการและการวินิจฉัย (ผ่านร้อยละ 62.7) ได้สูงกว่าส่วนอื่น พบว่าครูซึ่งอายุไม่เกิน 30 ปีมีความสัมพันธ์กับการผ่านในส่วนความรู้ทั่วไป
อาการและการวินิจฉัยและแบบประเมินทั้งฉบับ และการได้คุ้นเคยกับผู้ป่วยโรคสมาธิสั้นนอกโรงเรียนสัมพันธ์กับการผ่านแบบประเมินส่วนความรู้ทั่วไป
และคะแนนรวมทั้งฉบับ

สรุป: การศึกษานี้เป็นการศึกษาความรู้ความเข้าใจต่อโรคสมาธิสั้นของครูระดับประถมศึกษาเป็นครั้งแรกในประเทศไทย และพบว่าครูยังขาดความรู้
ความเข้าใจต่อโรคสมาธิสั้นซึ่งสอดคล้องกับการศึกษาในหลายประเทศ
