Original article

School bullying behavior in attention-deficit hyperactivity disorder patients with and without comorbid autism spectrum disorder at King Chulalongkorn Memorial Hospital

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Background: Children and adolescents with attention-deficit hyperactivity disorder (ADHD) are at high-risk of being involved in school bullying behavior. Studying the situation of bullying behavior and the factors affecting school bullying behavior of children with ADHD will lead to understanding and promote guideline development for school bullying behavior in these population.

Objectives: The purposes of present study were to study the prevalence, role, pattern, frequency and behavior of school bullying and victimization in children and adolescents with ADHD, including the other related factors to school bullying behavior, such as, personal factors and the severity of ADHD with comorbidities, especially ASD.

Methods: Cross-sectional descriptive study was applied in this study. The guardians of 10 – 18 years old children with ADHD, who were attending their children at the Child-Psychiatric Unit of King Chulalongkorn Memorial Hospital during February to December 2019, were requested to answer Swanson, Nolan, and Pelham, version (IV) (SNAP - IV) form to assess the severity of ADHD and the Autism Spectrum Screening Questionnaire (ASSQ) -Thai version form to screen for ASD symptoms. The children with ADHD were required to answer the Bully/Victim Questionnaire (BVQ) form to assess the prevalence, roles, form, frequency, and patterns of school bullying and victimization in children and adolescents with ADHD.

Results: The prevalence of school bullying behavior in ADHD children were 70.5%. Most children, were both bully and victims (31.9%). The verbal bullying was found as the most common pattern (38.1%). The statistically significant risk factors for being victims were ASSQ score which 19 points or higher (odds ratio (OR) = 2.47, $P = 0.004$). Risk factors for being bully were male gender (OR = 4.53, $P = 0.001$). Mild group of Oppositional Defiant (OR = 2.32, $P = 0.013$) and Moderate- Severe group of Oppositional Defiant (OR = 2.67, $P = 0.013$).

Conclusion: Currently, school bullying behavior in children and adolescents with ADHD are of high prevalence. Several factors were correlated with school bullying behavior. Comorbid ASD in ADHD children had increased the greater risk of victimization as 2.48 times of children without comorbid ASD. Understanding these factors will lead to develop new guidelines on prevention of school bully behavior in the future.

Keywords: Attention-deficit hyperactivity disorder, school bullying, bullying behavior and victimization in school, autistic spectrum disorder.

School bullying behavior has been a major problem worldwide among school-age children and adolescents. In 2016 the United Nations Educational, Scientific and Cultural Organization (UNESCO) reported that approximately 246 millions of children and adolescents have experienced violence and school bullying behavior. The prevalence of bullying and victimization in each research ranges from 10.0 - 65.0% of total students and varies according to social and cultural contexts. [1] From the study of Craig W, *et al*., in 2008, it was found that most children

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experienced school bullying behavior between the ages of 11 and 15. [2] The survey conducted by Tapanya S. in 2006, reported that almost 40.0% of students in Thailand were bullied and 4th grades students experience the most bullying.[3] School bullying problems cause negative short and long-term consequences for both the perpetrators and the victims. Especially for the victims, they tend to have mental health consequences such as depression, anxiety, losing self-esteem, or even suicide because they are unable to endure the pressure of being bullied. Additionally, bullying will decrease academic achievements and school participation; also it will increase strain that lead to committing acts of violence toward themselves and others.[4]

According to previous studies, children with Attention Deficit Hyperactivity Disorder (ADHD) are at higher - risk of being victim and bullying in school. The results of study conduct provided by Taipanya S. in 2011 found that 52.9% of patients with ADHD were involved in bullying. Most of them were in dual statuses (victim-bully group). Additionally, the victim group and the victim-bully group had higher devalued - feeling than non-involved group.[5]

ADHD and Autism Spectrum Disorder (ASD) are two major diagnoses in most of child and adolescent psychiatric services. Traditionally, both cannot be diagnosed together. However, The DSM-5 revisions include modifications to the exclusionary conditions of ADHD to be diagnosed together with ASD. From the study, ADHD with comorbid ASD was found between 28.2 – 87.0%. [6, 7]

Several studies stated that ADHD patients tended to increase the risk of causing school bullying behavior, comparing to normal children. [8 – 10] Forty-four percent of guardians of ADHD children reported that their children were victims of school bullying due to interpersonal deficit, personality characteristics, limited interest, emotional dysregulation and lack of ability to build relationship. It has been found that comorbidities of ADHD and ASD could cause more victimization in school bullying behavior. In 2006 study, conducted by Guillermo found that ASD children with comorbid ADHD increased 4.6 times of risk in being involved in school bullying, comparared to the patients without comorbid ADHD. [10]

The purposes of present study were to study the prevalence, role, pattern, frequency and behavior of school bullying and victimization in children and adolescents with ADHD, including the other related factors to school bullying behavior; such as, personal factors and the severity of ADHD with comorbidities, especially ASD, as well as to study how ASD as comorbidity in children and adolescents with ADHD affects the prevalence, role, frequency and behavior of school bullying will lead to the development of treatment guidelines and prevention of school bully behavior in the future.

Materials and methods

Study population

Cross-sectional descriptive study was conducted in this study. The subjects were ADHD children and adolescents aged between 10 – 18 years old who were attending the child and adolescent-psychiatric care at King Chulalongkorn Memorial Hospital during February to December, 2019. The ethical and trust sponsorship was approved in 2019 by the Ethics Committee of the Faculty of Medicine, Chulalongkorn University (IRB no**.** 762).

The inclusion criteria were: 1) 10 to 18 year-old children and adolescents with ADHD who were diagnosed by child and adolescent psychiatrists at the child and adolescent-psychiatric care at King Chulalongkorn Memorial Hospital; 2) subjects were studying in schools. The exclusion criteria were: 1) subjects or their guardians who were unable to understand and communicate in Thai; (2 ADHD patients with comorbid Schizophrenia and other types of psychosis; 3) ADHD patients with impaired intellectual function who were in moderate or lower levels; 4) guardians of ADHD patients with untreated psychosis or in the period that were unable to control the symptoms of the disease. Data were collected from 210 samples in accordance with set of inclusion criteria without sampling.

Data collection

The questionnaires were applied to gather data, consisting of two sets for parent and children. The parent's questionnaire was divided into three parts: demographic data of children (gender, age, education, ASSQ scores, severity of ADHD symptoms), Swanson, Nolan, and Pelham, version (IV) (SNAP-IV) form and Thai version of ASSQ. The SNAP-IV form comprises of 26 items that are included in the three domain of symptoms: Inattention (item 1 - 9), Hyperactivity/ Impulsivity (item 10 - 18) and Oppositional Defiant Disorder (item 19 - 26). Symptom severity is rate on 4-point scale. Responses

are scored as follow: 0 = Not at all, 1 = Just a little, 2 = Quite a bit and 3 = Very much. The score in each of two subsets (Inattention and Hyperactivity/ Impulsivity) are totaled to assess the severity of symptoms according to suggested guidelines which are Symptoms Not Clinically Significant (< 13 points), Mild (13 - 17 points) Moderate (18 - 22 points), and Severe (23 - 27 points). As for the subset of Oppositional Defiant Disorder, the scoring guideline is being divided as Symptoms Not Clinically Significant (< 8 points), Mild (8 - 13 points), Moderate s (14 - 18 points) and Severe (19 - 24 points). The reliability of the questionnaire using Cronbach's alpha is 0.93 - 0.96. [11]

The ASSQ-Thai version has been developed from High-Functioning Autism Spectrum Screening Questionnaire.[12, 13] It consists of 27 items rated on a 3-point scale as follow: not true (0 point), somewhat true (1point), certainly true (2 points). All points are tallied up to produce a total score. In this study, 19 points was considered the cutoff score for clinical population of High-Functioning Autism Spectrum. The validity of the origin questionnaire had the sensitivity of 0.93 and the specificity of 0.84. The reliability of the questionnaire using Cronbach's alpha is 0.9.

The Revised Olweus Bully/Victim Questionnaire (BVQ) was designed to survey the bullying and victimization in school. The questionnaire comprised of 37 items and cutoff score was calculated in the percentage from total responses as follow: "2 - 3 times per week/ about once per week/ 3 - 4 times per week" to indicate the bullying. The victimization was indicated from subjects' responses in questions no. 3 - 12 and the bullying behavior was determined from questions no. 22 - 31, any positive response in any question was classified in as positive. The patterns of bullying and victimization were evaluated from the questions no. 4 - 12 and no. 23 – 31, respectively. The reliability of the questionnaire using Cronbach's alpha Coefficient is 0.75.[3]

Statistical analysis

The analysis was performed using software Statistical Package for Social Science version 22 (SPSS). Descriptive statistics were analyzed using numbers, percentage, mean, frequency and standard deviation (SD).

The association of these variables, which are personal factors, severity of ADHD and having comorbid ASD with ADHD children, with school bullying behavior and victimization behavior were analyzed by Pearson Chi-Square and Fisher's exact test.

The predictive factors of being victims and bully in ADHD children were analyzed by Logistic Regression Analysis, controlling the influence from other variables by Forward Likelihood Ration method. The significant value was determined at $P < 0.05$.

Results

Demographic and clinical characteristics of the subjects are presented in Table 1. From total subjects (n = 210), the proportion of male (80.5%) are greater than female (19.5%). The mean age (standard deviation) of the subjects was 12.92 (± 2.24) years. The severity of ADHD of the majority of the subjects was in Not Clinically Significant group (41.9%). ASSQ scores of 19 points or higher was recorded in 44.3% of total subjects.

Table 2 shows the roles and patterns of school bullying behavior. It was found that the most of subjects were in dual status group representing as 31.9%, followed by victims group equals to non-involved group (29.5%) and bully group (9.1%), respectively. The most frequent patterns of victimization were verbal bullying (38.1%), excluding from activities on purpose (31.0%) and being subject of rumors (23.8%), respectively. Most subjects (73.6%) reported that they would tell others if they were bullied.

The factors associated with victimization in school bullying behavior were analyzed using Chi-square statistics and Fisher's exact test (Level of significance = $P < 0.05$). We found that age range, education, ASSQ score were statistically significant with victimization in school bullying behavior ($P = 0.001$, $P < 0.001$, $P = 0.005$). Furthermore, gender, ASSQ scores, SNAP-IV scores from Part Hyperactivity/ Impulsivity and Part Oppositional Defiant were significantly associated with being bullied in in school bullying behavior ($P = 0.001$, $P = 0.012$, $P = 0.045$, $P = 0.016$ respectively) as showed in Table 3.

As presented in Table 4, examined the statistically significant risk factors for being victims were ASSQ score which 19 points or higher (odds ratio (OR) = 2.47, 95.0% confidence interval (CI) = 1.34 - 4.56, $P = 0.004$). Risk factors for being bully were male gender (OR = 4.53, 95.0% CI = 1.87 - 10.95, $P = 0.001$). Mild group of Oppositional Defiant (OR = 2.32, 95.0% CI = 1.12 - 4.49, $P = 0.013$) and Moderate- Severe group of Oppositional Defiant (OR = 2.67, 95.0% CI = 1.23 - 5.76, $P = 0.013$).

Table 1. Summary of participant characteristics (n = 210).

Characteristics	n (%) or mean (± SD)
Gender	
Male 169 (80.5)	
Female	41 (19.5)
Age (years)	
Mean (SD)	12.92 (± 2.24)
Min - max	10 - 18
Age range	
Early adolescence (10 - 13)	128 (61.0)
Middle adolescence (14 - 16)	66 (31.4)
Late adolescence (17 - 18)	16 (7.6)
Education	
Upper - elementary	86 (41.0)
Lower - secondary	83 (39.5)
Upper - secondary high school/ vocational certificate	41 (19.5)
ASSQ Scores	
Lower than 19 points	117 (55.7)
19 points or higher	93 (44.3)
Severity of ADHD symptoms	
Part 1 Inattention	
Not clinically significant (< 13)	88 (41.9)
Mild (13 - 17)	69 (32.9)
Moderate – severe (18 - 27)	53 (25.2)
Part 2 Hyperactivity / impulsivity	
Not clinically significant (< 13)	136 (64.8)
Mild (13 - 17)	58 (27.6)
Moderate – severe (18 - 27)	16 (7.6)
Part 3 Oppositional defiant	
Not clinically significant (< 8)	88 (41.9)
Mild (8 - 13)	77 (36.7)
Moderate – severe (14 - 24)	45 (21.4)

Table 2. Roles and patterns in school bullying behavior (n = 210).

Characteristics	N (%)
Roles in school bullying behavior	
Victim	62 (29.5)
Bully	19 (9.1)
Dual status (victim - bully)	67 (31.9)
Non - involved	62 (29.5)
Patterns in school bullying behavior	
Made fun of, insulted	80 (38.1)
Exclude from activities on purpose	65 (31.0)
Subject of rumors	50 (23.8)
Subject of prejudice	43 (20.5)
Assault	37 (17.6)
Sexual harassment	34 (16.2)
Property destroyed on purpose	31 (14.8)
Others	30 (14.3)
Threatened with harm	28 (13.3)
Telling others when being bullied	84 (73.6)

Table 3. Factors related with being victim and bully (n = 210).

	Victims		Bully	
	n (%)	*P*-value	n (%)	*P*-value
Gender		0.064		0.001*
Male	109 (64.5)		79 (46.7)	
Female	20 (48.8)		7 (17.1)	
Age range		0.001*		0.195
Early adolescence (10 - 13)	90 (70.3)		58 (45.3)	
Middle adolescence (14 - 16)	35 (53.0)		24 (36.4)	
Late adolescence (17 - 18)	4 (25.0)		4 (25.0)	
Education		< 0.001*		0.128
Upper - elementary	61 (70.9)		42 (48.8)	
Lower - secondary	54 (65.1)		31 (37.3)	
Upper - secondary	14 (34.1)		13 (31.7)	
ASSQ score		0.005*		0.012*
Less than 19 points	62 (53.0)		39 (33.3)	
Greater than 19 points or equals	67 (72.0)		47 (50.5)	
Severity of ADHD symptoms				
Part 1 Inattention		0.496		0.140
Not clinically significant (< 13)	51 (58.0)		30 (34.1)	
Mild (13 - 17)	42 (60.9)		29 (42.0)	
Moderate – severe (18 - 27)	36 (67.9)		27 (50.9)	
Part 2 Hyperactivity / impulsivity		0.542		0.045*
Not clinically significant (< 13)	80 (58.8)		50 (36.8)	
Mild (13 - 17)	39 (67.2)		25 (43.1)	
Moderate – severe (18 - 27)	10 (62.5)		11 (68.8)	
Part 3 Oppositional defiant		0.125		0.016*
Not clinically significant (< 8)	51 (58.0)		26 (29.5)	
Mild (8 - 13)	54 (70.1)		37 (48.1)	
Moderate – severe (14 - 24)	24 (53.3)		23 (51.1)	

Table 4. Analysis of predictive factors of being victims and bully by logistic regression analysis (n = 210).

	Adjusted OR	95% CI	*P*-value
Predictive factors of being victims			
ASSQ score ≥ 19 (vs ASSQ scores < 19)	2.4	1.34 - 4.56	0.004*
Predictive factors of being bully			
Male (vs female)	4.5	1.87 - 10.95	0.001*
SNAP IV scores part 3 (vs not clinically significant - group)			
Mild group	2.3	1.20 - 4.49	0.013*
Moderate - severe group	2.6	1.23 - 5.76	0.013*

*$P < 0.05$

Discussion

In the present study, the prevalence of school bullying behavior in ADHD children were 70.5%. Corresponding to prior study, Butthabot in 2011was also reported that the prevalence of school bullying behavior in ADHD children were 52.9%[5], which was greater than 40.0% reported in the prior study of school bullying behavior in children without ADHD[3], indicating the higher prevalence of school bullying behavior in children with ADHD than children without ADHD.

In terms of roles in school bullying behavior, we found that most of ADHD children and adolescents were in dual status (victim-bully) representing at

31.9% and followed by the victim group as non-involved group (29.5%) in accordance with the study conducted by Sakarinkhul C, *et al*. in 2011 regarding to school bully behavior in normal children. The mentioned study found that most of subjects were in dual status [4, 5] and the most frequently used patterns were verbal bullying, excluding from activities on purpose and being subject of rumors respectively. Corresponding to prior study, it was also reported that verbal abuse, insulting and parody [4, 5] were the most found patterns in school bullying. It was clearly demonstrated that no differences were determined in terms of roles and patterns of victimization both for normal children and ADHD group.

The related factors to victimization in ADHD children and adolescents were age range, education level and ASSQ score. As for being bullied, the related factors were gender, severity of ADHD (Hyperactivity and Oppositional Defiant) and ASSQ score. Our result demonstrated that the severity of ADHD in Hyperactivity / impulsivity was accordant with bully role only, but not for victim role. This result could be explained that bully role was affected by the factor of impulse control.

Regarding to the previous studies in Thailand, none of them has studied about the comorbidity in ADHD children that could affect to school bullying behavior. Therefore, our research was aimed to study the factors causing by related comorbidities in school bullying behavior. We found that total scores of SNAP IV (Part 3), the survey questionnaire for comorbid ODD, were predictive factor for establishing bully role in school bullying behavior as well as comorbid ASD. As considered in the Mild symptoms group by SNAP IV (Part 3) scores, the mentioned subjects were 2.32 times greater than the Not - Clinically - Significant group for being bully and the Moderate-Severe symptoms has starred as bully for 2.7 times greater than Not - Clinically - Significant group.

In this study, we defined the subjects who had greater ASSQ score than 19 points or equals as the patients with comorbid ASD. Regarding our results, we found that comorbid ASD in ADHD children and adolescent was the significant predictive factor of victimization and the risk of being victim for the comorbid ASD group was 2.48 times greater, compared to the children with ADHD without comorbid ASD. Corresponding to the prior study, it was found that ASD patients tend to increase risk of being involved in school bullying behavior than normal children [8 – 10] and the risks were 2 times greater for ASD patients. [9] Especially the children with Asperger Syndrome or with High Function Autism, the study of Kate Sofronoff K, *et al*.[14] indicated that children with High Function Autism have theory of mind problem and interpersonal deficit causing the risk of victimization in school bullying behavior.

The samples of this study (children with ADHD) had 44.3% high scores (> 19) of ASSQ, it appeared to be higher than other studies of children with ADHD in community. In other studies, children with ADHD in the community has comorbidity of ASD only 20.0 – 25.0%. The possibility explanation may be the false positive from ASSQ screening tool or the subjects in this study were selected from teaching hospital, they may not represent to the children with ADHD in the community.

In the present study, the subjects were children and adolescents with ADHD who were attending the child and adolescent-psychiatric care at King Chulalongkorn Memorial Hospital which might have some differences from subjects in the other hospitals. Furthermore, the domicile of our subjects were from Bangkok Metropolitan Region that might affect the characteristics of schools, socio-economic status and other related factors to school bullying behavior. Moreover, some related factors were not collected in present study. This study did not analyze other physical and psychiatric comorbidities that could affect to school bullying behavior and ASSQ Form was only the screening test. The subjects with high ASSQ score could be evaluated further by doctors for the definite diagnosis of ASD.

Conclusion

The prevalence of school bullying behavior in children and adolescents with ADHD are at high level and tends to increase than prior studies. This result indicated the current situation of school bullying behavior. Several factors were correlated with school bullying behavior; such as comorbid ASD in ADHD children that had increased the greater risk of victimization as 2.48 times of children without comorbid ASD. Gender, severity of ASD and comorbid oppositional defiant disorder were related factors to bully role in school bullying behavior. Understanding the current situation and those related factors will lead to increase awareness of bullying issue and develop new guidelines on surveillance and prevention of school bully behavior in the future.

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Conflict of interest

The authors, hereby, declare no conflict of interest.

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