

Peer Victimization in Preadolescent Children With ADHD in Turkey

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Abstract

The present study aims to investigate peer victimization and its relationship with comorbid psychiatric diagnoses and quality of life (QoL) among children with attention deficit hyperactivity disorder (ADHD). Study sample consisted of 66 children with ADHD (mean age = 8.6 ± 1.1 years) and age- and gender-matched 66 controls (mean age = 8.5 ± 1.3 years). In self-reports, the ADHD group reported significantly higher rates of victimization and bullying than the non-ADHD group. Verbal and physical forms of victimization and bullying were the most prevalent forms in both groups; however, exclusion from peer groups, which is named as relational bullying, was the most significantly differing type between two groups. QoL parameters did not significantly differ between the children involved in bullying and those not involved, except for the lower physical QoL in victimized children in the control group. In conclusion, peer victimization was significantly more prevalent in the ADHD group than the non-ADHD group. Preventive measures are needed for peer victimization, especially for children with ADHD.

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Keywords

peer victimization, bullying, ADHD, quality of life, child–mother agreement

Introduction

Attention deficit hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disorders of childhood with a worldwide prevalence rate of 5.26% (Polanczyk, De Lima, Horta, Biederman, & Rohde, 2007). Recent studies from Turkey reported somewhat higher rates (Ercan, Bilalç, Özasan, & Rohde, 2015; Zorlu et al., 2015). Children with ADHD often have social problems (peer rejection, etc.) that are shown to be associated with worse prognosis (Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997).

Peer victimization/bullying is an aggressive behavior for a certain time, which aims intentional harm to others where there is an imbalance of power (Olweus, 1993). Increased rates of peer victimization among children with ADHD were documented in the literature. Studies supported a direct link between bullying and ADHD among children and adolescents (Becker, Mehari, Langberg, & Evans, 2017; Twyman et al., 2010; Unnever & Cornell, 2003). Children with ADHD were demonstrated to have a threefold increase in bullying and a tenfold increase in victimization (Holmberg & Hjern, 2008). Especially girls with ADHD were subjected to more risk of victimization (Sciberras, Ohan, & Anderson, 2012; Wiener & Mak, 2009).

Although the existing literature consistently shows that children with ADHD are at risk for peer victimization (Twyman et al., 2010), there are some gaps on bullying among children with ADHD. At the onset, literature mostly focused on the adolescent population (Becker et al., 2017; Chou, Liu, Yang, Yen, & Hu, 2018; Fite, Evans, Cooley, & Rubens, 2014; Unnever & Cornell, 2003; Wiener & Mak, 2009) and studies in the preadolescent group (Holmberg & Hjern, 2008), especially with younger ages, is lacking. Peer victimization was shown to have a persistency over childhood (Sourander, Helstelä, Helenius, & Piha, 2000); especially, children who are bully victims are at a greater risk for long-term stability (Kumpulainen, Räsänen, & Henttonen, 1999). Therefore, early identification may prevent children from developing mental health problems and criminality that are shown to be associated with peer victimization (Sourander et al., 2007).

Second, diagnosis of ADHD was based on self-reported rating scales in the community trials (Fite et al., 2014) or a previously established diagnosis in clinical samples (Wiener & Mak, 2009). However, the gold standard for a diagnosis of ADHD is clinical interview (Becker et al., 2017; Holmberg & Hjern, 2008) and the best approach may be when the diagnostic interview is carried out while the study is continuing. Third, we know that peer victimization is associated

with depressive and anxiety symptoms (Becker et al., 2017), yet we do not know from the existing literature whether it is associated with a clinical diagnosis of depression or anxiety disorder. Besides, the existing literature about mother–child agreement on peer victimization among children with ADHD is significantly lacking as there is only one study that investigated it in a clinical sample, which reported low agreement (Hu et al., 2018). To the best of our knowledge, no research study was conducted on mother–child agreement in a community sample of children with ADHD. Other studies in the literature are mostly based on mono-informants for bullying experiences, while using a multi-informant method may provide more unbiased results (Becker et al., 2017). Finally, we do know that bullying is associated with lower quality of life (QoL), especially for psychosocial QoL (Velderman et al., 2008; Wilkins-Shurmer et al., 2003), in typically developing children; however, we do not know whether peer victimization is associated with worse QoL in children with ADHD.

The present study aimed to examine peer victimization in primary school children with ADHD and compare it with a randomly selected control group without ADHD. Both children and parents filled out a questionnaire on peer victimization to compare mother–child agreement. Diagnoses of ADHD and comorbidities were assessed via a reliable and valid diagnostic interview (Schedule for Affective Disorders and Schizophrenia for School-Age Children–Present Version [K-SADS-P]). QoL was assessed via parent proxy reports.

Based on the findings in the existing literature, the following hypotheses were studied:

Hypothesis 1: Peer victimization and bullying are more prevalent in the ADHD group.

Hypothesis 2: Mother–child agreement on bullying in the ADHD group is lower than the control group.

Hypothesis 3: Internalizing disorders (based on semistructured interview) are more prevalent in victimized children and especially in ADHD group.

Hypothesis 4: Psychosocial QoL is worse in victimized children, especially in ADHD group.

Method

Participants

The present study was performed in a public school in Fatih district in Istanbul between March and May 2018. Primary schools include first to fourth graders, aged between 6 and 10 years, in Turkey. A total of 885 out of 1007 children (87.9%) were screened via teacher reports of Turgay Disruptive

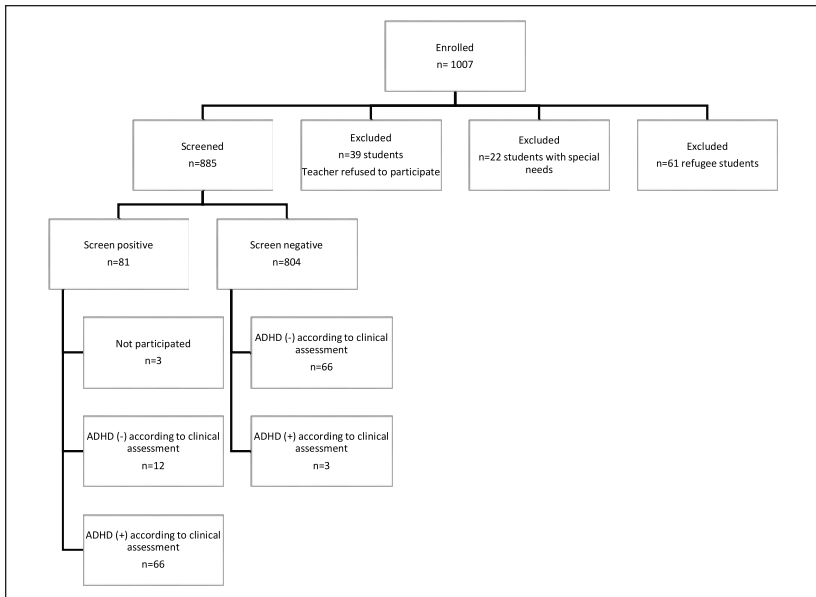


Figure 1. Flow diagram of the study.

Note. ADHD = attention deficit hyperactivity disorder.

Behavior Disorders Rating Scale (TDBRS). Refugee students ($n = 61$) were excluded due to language problems (lack of a translator), children with special needs (due to intellectual disability, autism spectrum disorders, and severe learning disabilities; $n = 22$) were excluded, and a teacher refused to participate (running a class with 39 students). A total number of 81 children were detected to be screen positive, of whom three did not participate in the clinical interview and 12 did not fulfill the criteria of ADHD in the semistructured interview. Thus, a total number of 66 children were enrolled in the study. Age- and gender-matched controls were selected randomly from screen negative children. Three of the screen negative children who fulfilled the diagnostic criteria of ADHD in the semistructured interview were removed from the study and randomly selected three children were added to the control group (Figure 1).

TDBRS

It is an instrument based on the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (*DSM-IV*; American Psychiatric Association, 1994) diagnostic criteria of ADHD and disruptive behavior disorders (Turgay, 1994).

The TDBRS is a 4-point Likert-type scale (0 = *not at all*, 1 = *just a little*, 2 = *much*, 3 = *very much*) with 42 items. The first 18 items of the TDBRS, which are assessing ADHD symptoms (nine items for inattention, nine items for hyperactivity-impulsivity), were used as a screening tool. Parents and teachers rated each symptom on frequency; a rating of *much* or *very much* is considered as positive for each item. Children who had at least five of the nine inattentive and/or hyperactive-impulsive items in teacher scales were considered as “screen-positive.” The Turkish form of TDBRS was shown to be valid and reliable (Ercan, Amado, Somer, & Çıkoğlu, 2001).

All of the screen-positive children in teacher reports were invited to participate in the clinical interview via an invitation letter. Parents of the children were asked to fill out a sociodemographic form (which consisted of a definition of bullying and two questions about whether their children involved in bullying), ADHD items of the TDBRS, and a QoL scale (Pediatric Quality of Life Inventory [PedsQL]) about their children. At the same time, children were asked to fill out the Revised Olweus Bully/Victim Questionnaire. After that, a semistructured diagnostic interview (K-SADS-P) was carried out to examine ADHD and comorbid psychiatric disorders.

K-SADS-P

K-SADS-P is a semistructured diagnostic interview based on *DSM-IV*, which investigates a wide range of psychiatric disorders (schizophrenia, mood disorders, anxiety disorders, obsessive-compulsive disorder, elimination disorders, eating disorders, ADHD, disruptive disorders, tic disorders, trauma-related disorders, substance use disorders; Kaufman et al., 1997). Turkish form of the K-SADS-P is shown to be reliable and valid with high interrater reliability (90%-100%) and the test-retest reliability (.63-1.00; Gökler et al., 2004). Psychiatric disorders that are not assessed by K-SADS-P (learning disorders, autism spectrum disorders, intellectual disability, etc.) were evaluated in the clinical interview based on *DSM*, Fifth Edition (*DSM-5*; American Psychiatric Association, 2013) criteria. All of the interviews were carried out by an experienced, certified child and adolescent psychiatrist (accountable care organization [Abdurrahman Cahid Örengül]).

The Revised Olweus Bully/Victim Questionnaire (OBVQ)

Children were asked to complete OBVQ to evaluate peer victimization in the past couple of months. The revised OBVQ (Olweus, 1996), is a self-report instrument with 39 items, which starts with questions about whether the child likes or dislikes the school and number of friends at the school. After a clear definition of bullying, the OBVQ continues with items about prevalence (How

often have you been bullied at school in the past couple of months?), forms (verbal [I was called mean names, was made fun of, or teased in a hurtful way], exclusion [Other students left me out of things on purpose, excluded me from their group of friends, or completely ignored me], physical, rumors, damage, threat, racial, sexual, cyber, and other), location, duration (How long has the bullying lasted?) and reporting of peer victimization (Have you told anyone that you have been bullied in the past couple of months?). After items about victimization, the scale continues with items about bullying (How often have you taken part in bullying another student[s] at school in the past couple of months?) and feelings and attitudes regarding bullying (Do you think you could join in bullying a student whom you do not like?). Response options about the prevalence of bullying behavior and specific forms are *none, only once or twice, two or three times a month, about once a week*, and several times a week. Bullying behaviors displayed two to three times monthly is accepted as a cutoff point to be a victim, bully, or bully/victim (Solberg & Olweus, 2003). The Turkish version of the scale was shown to be valid and reliable, with a Cronbach's alpha value of .81 (Tıprıdamaz Sipahi, 2008). Likewise, the Cronbach's alpha value of the scale was .81 in the present study. Questions about sexual forms of bullying were removed due to the Ministry of National Education Istanbul Provincial Directorate's demand.

All children included in the study were fluent in reading and writing Turkish, however, as they are in earlier ages, assistance was provided whenever they required. The children were given copies of the OBVQ, the research assistant (blinded to the diagnosis and group of the children) read the items aloud to them, and the children circled their desired responses on the given copy. If there was a positive answer on questionnaire, the research assistant asked children about details of the events after completion of the questionnaire to be sure about the answers reported concerning if there is an incident of bullying or not.

As there is not a validated instrument in Turkish language to evaluate children's bullying-related problems from the perspectives of their parents, authors added two questions about victimization ("How often has your child been bullied at school in the past couple of months?") and bullying ("How often has your child taken part in bullying another student(s) at school in the past couple of months?") with a detailed definition of bullying with examples. Response options were the same as the revised OBVQ.

PedsQL

It is an inventory to measure the QoL of the child (Varni, Seid, & Rode, 1999). PedsQL consists of 23 items (eight for physical [i.e., walking more than one block], five for each of emotional [i.e., feeling sad or blue], social [i.e., getting along with other children], and school [i.e., paying attention] functioning) scored

on a 5-point Likert-type scale from 0 to 4 (0 = *never a problem*, 4 = *always a problem*). Each score is transformed as follows after the completion of the form, 0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0, in which higher scores indicate a better QoL. The sum of scores of the items is divided by the number of items in each category. The result from this division provides the QoL score. In addition, a psychosocial health summary score (involves emotional, social, and school functioning) and total scale score can be computed (involves psychosocial and physical functioning). Turkish version of PedsQL was shown to be reliable and valid with a Cronbach's alpha value of .88 (Memik, Ağaoğlu, Coşkun, & Karakaya, 2008). Parent proxy report form was used in the present study because the younger children, especially those who have ADHD, may have limited attention span and we used a long questionnaire (OBVQ) and psychiatric interview (K-SADS), which may tire them. As a result, we thought that additional scales may compromise the reliability of responses of children.

Sociodemographic Form

It was developed by the authors of the study. The sociodemographic form includes items about child's age, grades, psychiatric and medical history, as well as parental age, education, medical and psychiatric history, marital status, and income.

Statistical Analysis

Statistical analyses were performed with the SPSS, Version 19.0 for Windows (Chicago, IL, USA). All continuous variables were tested for normality and homogeneity of variance. In case the distribution did not meet normality conditions, a Mann–Whitney U test was carried out for comparisons. In case of a normal distribution, students' *t* test was performed to compare numerical variables between two groups. Chi-square test was performed to compare categorical variables. We examined the level of agreement between child and mother reported bullying with Cohen's kappa. A *p* value of $\leq .05$ was accepted to be statistically significant.

Results

Sociodemographic Variables

Age (ADHD group 8.6 ± 1.1 years, control group 8.5 ± 1.3 years; $Z = 0.9$; $p = .37$), gender (ADHD group M/F = 56/10, control group M/F = 56/10; $\chi^2 = 0$, $p = 1.00$), and other sociodemographic variables did not differ significantly between the two groups (Table 1).

Table 1. Sociodemographic Variables, TDBRS Total, PedsQL Total Scores, and Psychiatric Diagnosis.

Variable	ADHD (<i>n</i> = 66)	Control (<i>n</i> = 66)	Statistics
Age (months)	103.6 ± 13.7	101.4 ± 15.7	<i>Z</i> = 0.9, <i>p</i> = .37
Sex (M/F)	56/10	56/10	$\chi^2 = 0$, <i>p</i> = 1.00
Maternal age (years)	35.71 ± 4.83	37.56 ± 5.98	<i>t</i> = 1.95, <i>p</i> = .053
Maternal education (≥high school)	18 (27.3%)	21 (31.8%)	$\chi^2 = 0.33$, <i>p</i> = .57
Paternal age (years)	40.92 ± 5.37	42.03 ± 6.84	<i>t</i> = 1.03, <i>p</i> = .31
Paternal education (≥high school)	36 (55.4%)	32 (48.5%)	$\chi^2 = 0.63$, <i>p</i> = .43
Income (≥US\$8,000/year)	19 (28.8%)	11 (16.7%)	$\chi^2 = 2.76$, <i>p</i> = .97
Family status (separated)	7 (10.6%)	2 (3.0%)	<i>p</i> = .16 ^a
Number of siblings	2 (1-2)	2 (1-2)	<i>Z</i> = 0.66, <i>p</i> = .51
TDBRS total-parent	19.70 ± 11.10	9.45 ± 6.64	<i>T</i> = 6.43, <i>p</i> < .001
TDBRS total-teacher	31.94 ± 9.83	7.89 ± 8.56	<i>T</i> = 14.98, <i>p</i> < .001
PedsQL total	77.30 ± 11.91	88.59 ± 7.11	<i>T</i> = 6.62, <i>p</i> < .001
Anxiety disorders	23 (34.8%)	15 (22.7%)	$\chi^2 = 2.37$, <i>p</i> = .12
ODD	19 (28.8%)	3 (4.5%)	$\chi^2 = 13.96$, <i>p</i> < .001
Learning disorders	8 (12.1%)	0 (0%)	<i>p</i> = .006 ^a
Any other psychiatric disorder	20 (30.3%)	11 (16.7%)	$\chi^2 = 3.42$, <i>p</i> = .065

Note. ADHD = attention deficit hyperactivity disorder; TDBRS = Turgay Disruptive Behavior Disorders Rating Scale; PedsQL = Pediatric Quality of Life Inventory; ODD = oppositional defiant disorder. M = male; F = female.

^aFisher's Exact Test.

Diagnosis and Comorbidities

Results showed a prevalence rate of 7.8% for ADHD in our total sample. ADHD combined type was the most prevalent subtype (*n* = 32, 48.5% for combined type; *n* = 26, 39.4% for attention deficit; *n* = 8, 12.1% for hyperactive impulsive type). A total of 42 subjects (63.6%) in the ADHD group had at least one comorbid diagnosis. Most prevalent comorbid diagnoses were anxiety disorders (*n* = 23, 34.8%), oppositional defiant disorder (*n* = 19, 28.8%), elimination disorders (*n* = 9, 13.6%), learning disorders (*n* = 7, 10.6%), and tic disorders (*n* = 6, 9.1%). In the semistructured interview, 22 subjects (33.3%) in the control group had at least one psychiatric diagnosis. Most prevalent psychiatric diagnoses were anxiety disorders (*n* = 15, 22.7%), elimination disorders (*n* = 5, 7.6%), oppositional defiant disorder (*n* = 3, 4.5%), and tic disorders (*n* = 2, 3.0%).

Table 2. Rates of Different Types of Victimization and Bullying.

	ADHD	Control	Statistics
Victimization (total)	37 (56.1%)	17 (25.8%)	$\chi^2 = 12.54, p < .001$
Verbal	23 (34.8%)	11 (16.7%)	$\chi^2 = 5.71, p = .017$
Exclusion	16 (24.2%)	2 (3.0%)	$\chi^2 = 12.61, p < .001$
Physical	18 (27.3%)	6 (9.1%)	$\chi^2 = 7.33, p = .007$
Rumors	4 (6.1%)	1 (1.5%)	$p = .37^a$
Damage	6 (9.1%)	2 (3.0%)	$p = .27^a$
Threat	4 (6.1%)	2 (3.0%)	$p = .68^a$
Racial	5 (7.6%)	1 (1.5%)	$p = .21^a$
Cyber	4 (6.1%)	0 (0%)	$p = .12^a$
Other	3 (4.5%)	2 (3.0%)	$p = 1.00^a$
Bullying (total)	14 (21.2%)	0 (0%)	$\chi^2 = 15.66, p < .001$
Verbal	8 (12.1%)	0 (0%)	$p = .006^a$
Exclusion	5 (7.6%)	0 (0%)	$p = .058^a$
Physical	4 (6.1%)	0 (0%)	$p = .12^a$
Rumors	2 (3.0%)	0 (0%)	$p = .50^a$
Damage	1 (1.5%)	0 (0%)	$p = 1.00^a$
Threat	1 (1.5%)	0 (0%)	$p = 1.00^a$
Racial	2 (3.0%)	0 (0%)	$p = .50^a$
Cyber	0 (0%)	0 (0%)	<i>ns</i>
Other	0 (0%)	0 (0%)	<i>ns</i>

Note. ADHD = attention deficit hyperactivity disorder; *ns* = not significant.

^aFisher's Exact Test.

Bullying Status in Self-Reports

The rate of peer victimization was 56.1% ($n = 37$) in the ADHD group and 25.8% ($n = 17$) in the control group ($\chi^2 = 12.54, p < .001$). The rate of bullying was 21.2% ($n = 14$) in the ADHD group and 0% in the control group ($\chi^2 = 15.66, p < .001$). The most prevalent form of the victimization and bullying was verbal. Forms of victimization and bullying behavior are listed in Table 2.

Comorbid Psychiatric Diagnoses and QoL of Victims

Presence rate of comorbid psychiatric disorders did not significantly differ between victimized and nonvictimized subjects. However, in the ADHD group, subjects who bully others were more likely to have comorbid anxiety disorders ($n = 9$, 64.3% for bullies and $n = 14$, 26.9% for others; Fisher's

Table 3. PedsQL Scores in Subjects With Different Bullying Status.

	ADHD Group ^a			Control Group ^b	
	Bully-Victim (<i>n</i> = 12)	Victim (<i>n</i> = 25)	Not Involved (<i>n</i> = 27)	Victim (<i>n</i> = 17)	Not Involved (<i>n</i> = 49)
Physical QoL	95.31 ± 4.11	84.75 ± 13.36	87.38 ± 12.96	88.24 ± 5.69 ^c	93.75 ± 7.84
Emotional QoL	70.08 ± 17.24	69.40 ± 16.29	72.41 ± 17.45	76.76 ± 14.78	80.71 ± 16.36
Social QoL	85.83 ± 11.84	83.60 ± 15.31	86.30 ± 12.98	92.94 ± 7.30	95.71 ± 6.21
School QoL	68.33 ± 20.04	65.60 ± 15.31	68.89 ± 23.63	87.06 ± 9.37	87.45 ± 10.21
Psychosocial QoL	74.86 ± 14.15	72.87 ± 12.69	75.86 ± 13.80	85.59 ± 7.48	87.96 ± 8.22
Total QoL	79.97 ± 11.12	75.83 ± 11.81	78.74 ± 11.52	86.25 ± 6.21	89.41 ± 7.27

Note. PedsQL = Pediatric Quality of Life Inventory; ADHD = attention deficit hyperactivity disorder; QoL = quality of life.

^aTwo subjects in the ADHD group who were detected as bully were excluded from the QoL analysis.

^bThere were no bullies or bully/victims in control group.

^cSignificantly lower than subjects who are not involved, $p = .001$.

Exact Test $p = .013$) or a learning disorder ($n = 4$, 28.6% for bullies and $n = 4$, 7.7% for others; Fisher's Exact Test $p = .056$).

Opposite to our hypothesis, psychosocial QoL did not differ between those involved in bullying and those not involved. Physical QoL was significantly lower in the victims in the control group (88.24 ± 5.69 vs. 93.75 ± 7.84 ; $z = -3.37$, $p = .001$) and higher in the bully victims than victims in the ADHD group (95.31 ± 4.11 vs. 84.75 ± 13.36 ; $z = -2.74$, $p = .006$). Other parameters about QoL did not differ between victims, bully victims, and noninvolved subjects. (Table 3)

Parental Reports About Bullying

According to the parental reports, 38.5% ($n = 25$) of the parents in the ADHD group and 19.7% ($n = 13$) of the parents in the control group reported that their children had been victimized at least once during the past couple of months ($\chi^2 = 5.60$, $p = .018$). In addition, three parents (4.5%) in the control group and 12 parents (18.5%) in the ADHD group reported that their children had bullied another student at least once during the past couple of months ($\chi^2 = 6.26$, $p = .012$; Table 4).

Only eight (29.6%) of the 27 subjects in the ADHD group, who reported to bully others at least once, had also been reported by their parents as to bully others at least once ($\kappa = 0.208$, $p = .05$). Twenty-three (46.9%) of the 49 subjects in the ADHD group and eight (25.0%) of the 32 subjects in the control group, who reported to have been victimized at least once, were reported

Table 4. Comparison Between Parental and Self-Reported Bullying Incidents.

	Self-Report				Parental Report			
	Victimization		Bullying		Victimization		Bullying	
	ADHD	Control	ADHD	Control	ADHD	Control	ADHD	Control
Never	17 (25.8%)	34 (51.5%)	39 (59.1%)	60 (90.9%)	40 (61.5%)	53 (80.3%)	53 (81.5%)	63 (95.5%)
Once or twice	12 (18.2%)	15 (22.7%)	13 (19.7%)	6 (9.1%)	11 (16.9%)	9 (13.6%)	7 (10.6%)	2 (3.0%)
2 or 3 times per month	10 (15.2%)	8 (12.1%)	8 (12.1%)	—	3 (4.6%)	1 (1.5%)	1 (1.5%)	1 (1.5%)
About once a week	8 (12.1%)	2 (3.0%)	3 (4.5%)	—	2 (3.1%)	—	2 (3.1%)	—
Several times a week	19 (28.8%)	7 (10.6%)	3 (4.5%)	—	9 (13.6%)	3 (4.5%)	2 (3.1%)	—

Note. ADHD = attention deficit hyperactivity disorder.

as to be victimized at least once in the parental report ($\kappa = 0.229$, $p = .014$ for ADHD group; $\kappa = 0.105$, $p = .293$ for control group).

Discussion

The present study shows higher victimization and bullying rates among children with ADHD than non-ADHD peers. To the best of our knowledge, this is the first controlled study assessing victimization in children with ADHD in the primary school. Results yielded that 56.1% of the ADHD group reported being victimized during the past couple of months and 21.2% reported that they bullied others. Results of the study are in line with a previous study from Sweden, which reported higher rates of bullying (odds ratio [OR] = 3.8) and victimization ($OR = 10.8$) in ADHD group (Holmberg & Hjern, 2008). A study from Turkey with a clinical group of ADHD children aged between 6 and 18 years showed that nearly 50% of them were engaged in bullying behavior (Orengul & Sabuncuoglu, 2018). A study from the United States reported that 57% of children with ADHD in a school sample had been involved in victimization at least once per week (Becker et al., 2017). However, in a study from Taiwan with a clinical group of adolescents with ADHD, Chou et al. reported the rates of the victims, bullies, and bully-victims among the children with ADHD as 14.6%, 8.4%, and 5.6%, respectively (Chou et al., 2018). Our findings, which are in line with the existing literature, except the study performed by Chou et al. (2018), shows that, nearly half of the children with ADHD are involved in bullying.

The most prevalent form of bullying found in the present study was verbal, followed by physical victimization in both groups. Contrary to our findings, a study on adolescents with ADHD (mean age 12.56 ± 0.98) reported relational victimization as the most prevalent form (51%; Becker et al., 2017). Two other studies of adolescents with ADHD reported higher relational victimization than physical victimization (Chou et al., 2018; Sciberras et al., 2012). The present study also yielded relatively high rates of exclusion from peer groups (24.2%) in the ADHD group, as compared with the control group (3.0%). In addition to that, 7.6% of the subjects in ADHD group reported to bully others via exclusion. Children with ADHD may be more vulnerable to relational victimization, which is defined as attempts to harm other students via excluding from conversations, activities, or peer group. Especially, impulsive symptoms of ADHD may limit their ability to form and sustain relationships with their peers (Hoza et al., 2005). Therefore children with ADHD may have very few friends, which make these children vulnerable to bullying in adolescence (Cardoos & Hinshaw, 2011) and, eventually,

experience exclusion from peer groups beginning from the early years of their school life.

Prevalence rates of psychiatric comorbidities in the current study were in line with recent studies from Turkey. A study in elementary school children reported 8% prevalence rate of ADHD, 60% of whom had at least one comorbid diagnosis (Zorlu et al., 2015). A study by Ercan, Bilaç, Özaslan, and Ardic (2016) showed that 12.7% of children in primary school had ADHD and 25.6% of them had at least one psychiatric diagnosis with moderate impairment (Ercan et al., 2016). Psychiatric comorbidities did not differ between victimized and nonvictimized children in our study. Interestingly, the subjects who bully others in ADHD group had significantly higher rates of a comorbid anxiety disorder. It is well known that victimization is related to elevated depression and anxiety symptoms among typically developing children (Craig, 1998; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Sabuncuoğlu, Akyuva, Altınöz, & Berkem, 2006) and children with ADHD (Hu, Chou, & Yen, 2016). The present study yielded an elevated rate of comorbid anxiety disorders in children who reported to bully others. It should be taken into consideration that most of the children in our sample had also been victimized. Bully-victims were reported to be most significantly associated with mental health problems like ADHD, depression, and anxiety (Kaltiala-Heino, Rimpelä, Rantanen, & Rimpelä, 2000; Kumpulainen, Räsänen, & Puura, 2001). However, our results should be cautiously interpreted due to the cross-sectional design of the present study and low sample size, and thus longitudinal studies are needed to interpret cause–effect relationship between anxiety disorders and bullying.

QoL analysis yielded a lower physical QoL in victims in the control group and higher physical QoL in bully-victims in ADHD than noninvolved subjects. A study with a larger community sample from Australia reported lower psychosocial QoL in the victims; however, physical QoL did not differ between two groups (Wilkins-Shurmer et al., 2003). In that study, subjects were not controlled for psychopathologies, especially for ADHD. Another study from the Netherlands reported lower QoL in all QoL parameters in the victims in a community sample (Velderman et al., 2008). Contrary to our expectation and the existing literature, psychosocial QoL did not differ significantly between the victims and noninvolved subjects. Nevertheless, psychosocial QoL scores were lower in the victims in both groups, however, the difference did not reach statistical significance level. One of the possible explanations of insignificant results in psychosocial QoL could be the small sample size. In addition, neurodevelopmental psychopathologies like ADHD are well known to be associated with both lower QoL and peer victimization (Holmberg & Hjern, 2008; Klomek et al., 2007; Unnever & Cornell, 2003).

Consequently, after controlling for ADHD, detrimental effects of bullying on QoL might be more difficult to detect. Studies with larger sample sizes and controlled for psychopathologies are needed to demonstrate the link between QoL and bullying.

Parental reports yielded a poor and insignificant agreement with self-reports in the control group, but a significant but poor agreement in ADHD group. A recent study from Taiwan demonstrated fair mother–child agreement for verbal and relational victimization, but poor agreement for physical victimization and bullying in children with ADHD (Hu et al., 2018). An epidemiological study with 2,232 British children reported that 56% of the victimized children could be correctly identified by their mothers, with a kappa coefficient of 0.20 (Shakoor et al., 2011). In our study, similar kappa coefficients were detected for ADHD group, but not for the control group. Mothers of the children with ADHD may be more alert to changes in their children's behavior than mothers of the control group. Further research is needed to detect the reasons for poor agreement.

Strengths of the present study include a community sample of children with ADHD diagnosed via semistructured interview and presence of a randomly selected non-ADHD control group. Another strength of the present study is a detailed assessment tool with a definition of bullying and examining its different forms.

On the contrary, the cross-sectional design of the study limits the ability to make a causal relationship. We only used a teacher report as a screening method, thus socially better adjusted children with ADHD might be left out. We used parent proxy reports for QoL because especially younger children with ADHD may have been bored with a long questionnaire. More objective methods to measure QoL, such as clinician reports, and based on a multi-informant methodology, including children, parents, and teachers could provide a more reliable picture of the QoL of the children. However, parent and child reports of the pediatric QoL scale were shown to have good correlations with parent reports in ADHD group (Varni & Burwinkle, 2006). However, we adopted a multi-informant approach to overcome mono-informant biases (Ladd & Kochenderfer-Ladd, 2002), which are self-reports and parental reports, to detect bullying behaviors. Self-reports are reported to be a better way to detect victimization (Ladd & Kochenderfer-Ladd, 2002), however, peer nominations may be a better tool to detect bullying behavior (Seals & Young, 2003). Rates of bullying in the study may be underreported because of self-attribution bias. We used OBVQ as a self-report tool, however, scale is typically used for third to 12th graders. The scale was earlier used in a Turkish study with 6- to 18-year-old children and adolescents (Orengul & Sabuncuoglu, 2018), Cronbach's alpha values were similar to the reliability study in Turkish

language and additionally we provided reading assistance for a better adaptation. Due to the small sample size, comparisons of QoL between victims and noninvolved subjects may lack statistical power. Finally, our study took place in a public school in the Fatih district, which is a growing subprovince with a population of 433,000, mostly low to middle socioeconomic class. The school that our study was performed is a public school, providing education to a low to middle socioeconomic class. Although most of the children (nearly 95%) attend public primary schools in Turkey and results of the study are in line with studies from other parts of Turkey (Zorlu et al., 2015), study population may not represent the whole Turkish population.

In conclusion, ADHD may be associated with peer victimization and subject children to bullying even in the early years of their school life. Primary school years may be an important period for learning socially appropriate behavior and bullying in this age group may worsen the clinical course of ADHD (Taylor, Saylor, Twyman, & Macias, 2010). Clinicians should be aware of bullying and victimization and consider enquiring such behavior patterns in their routine assessment and warn parents about peer victimization and its detrimental effect to child's mental health. Longitudinal research is needed to further evaluate the effects of school bullying in children with ADHD.

Summary

Higher rates of victimization and bullying others were reported in ADHD group. Verbal, physical, and relational forms of victimization were the most prevalent types of victimization and bullying. Mother-child agreement was low in the sample. ADHD may be a risk factor for bullying throughout very early years of their school ages. Clinicians should inquire bullying in routine psychiatric evaluation. Preventive measures for peer victimization are needed especially for children with ADHD.

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