



The effects of attention deficit/hyperactivity disorder on adolescents exposed to peer victimization

Serdar Karatoprak^{a,*}, Abdulkaki Akyildiz^a, Yunus Emre Dönmez^b

^aKonya City Hospital, Department of Child and Adolescent Psychiatry, Konya, Türkiye

^bInonu University, Faculty of Medicine, Department of Child and Adolescent Psychiatry, Malatya, Türkiye

Abstract

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Aim: Peer victimization is more common in adolescents with ADHD. Since more internalizing behaviors, externalizing behaviors and academic problems are observed in adolescents exposed to peer victimization, these problems may occur more severely in adolescents with ADHD who are exposed to peer victimization. In this study, it was aimed to investigate the effects of ADHD on internalizing and externalizing behaviors, depression, academic problems in adolescents with ADHD who were exposed to peer victimization.

Materials and Methods: This cross-sectional study was conducted with 169 adolescents. Participants completed Socio-demographic Data Form, Olweus Bully/Victim Questionnaire, Strengths and Difficulties Questionnaire-Adolescent Form and Children's Depression Inventory. The diagnosis of ADHD was determined according to the diagnostic criteria in DSM-V.

Results: The study was completed with 41 adolescents with ADHD exposed to peer victimization, 69 adolescents without ADHD exposed to peer victimization, 59 adolescents without ADHD and were not exposed to peer victimization. There was no statistically significant difference between groups in terms of sociodemographic characteristics. School absenteeism was more common in ADHD group. Externalizing behaviors were found to be statistically significantly higher in the ADHD group.

Conclusion: The results of this study have revealed that adolescents with ADHD who are exposed to peer victimization exhibit more severe externalizing behaviors. Therefore, ADHD should be specifically investigated in adolescents exposed to peer victimization who develop more severe externalizing behaviors.



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Introduction

Peer bullying is defined as the repeated exposure of a child or adolescent who has difficulty in self-defense, to deliberately offensive behavior by one or more students [1]. Negative behaviors can be in the form of physical contact (pushing, hitting, kicking), words (threatening, teasing), as well as gestures, intentional exclusion from the peer group [1]. Approximately 50% of students are exposed to bullying at some point in their lives, and today, peer bullying is a serious health problem for children and adolescents [2, 3]. Peer bullying affects physical and mental health, social relationships and academic success. Different psychiatric and physical symptoms occur in each child involved in peer bullying, depending on the role they play. Psychosomatic symptoms such as headache, stomachache, loss of appetite, sleep problems, enuresis, psychotic symptoms, borderline

personality disorder (BPD), eating disorder, depression, self-mutilation and suicidal behaviors are more common in children who are exposed to bullying [4-6]. These children have also more absenteeism and school failure [7]. Attention deficit hyperactivity disorder (ADHD) is one of the neurodevelopmental disorders characterized by hyperactivity, short attention span and impulsivity, the symptoms of which may begin in preschool children and whose effects can continue into adulthood [8]. Children with ADHD are more likely to show emotional and behavioral difficulties and problems with social functioning. These children also have problems with being accepted by their peers, making friends, maintaining close friendships [9]. In several studies, it has been determined that there is increased peer victimization (PV) in children with ADHD and there is a direct relationship between ADHD and peer bullying. In a longitudinal study by Yang et al., it has been shown that ADHD symptoms are associated with a five-fold increased victimization risk in traditional bully-

*Corresponding author:

Email address: sdrkrtrprk@hotmail.com (Serdar Karatoprak)

ing, and ADHD symptoms could predict bullying victimization after 2 years [10]. It is stated that adolescents with ADHD are easy and preferred targets for bullying since they are easily provoked and have poor peer support [11]. Children with ADHD were found to display more internalizing and externalizing behaviors than unaffected children [12, 13], therefore, it is possible that more internalizing and externalizing behaviors occur in adolescents with ADHD who are exposed to PV. It has been also suggested that comorbid internalizing or externalizing problems may be important factors in the prediction of peer bullying in children and adolescents with ADHD [14, 15]. The relationship between internalizing behaviors and PV was found to be stronger in the presence of ADHD [16]. In addition, children with ADHD are also more likely to be exposed to PV as they are more likely to display externalizing behaviors [16]. Previous studies have generally focused on the predictive effect of internalizing behaviors on PV in children with ADHD [16, 17]. Studies investigating the effects of ADHD on internalizing behaviors, externalizing behaviors, depression in adolescents who are exposed to PV are limited [11, 18].

In addition to internalizing and externalizing behaviors, in both adolescents with ADHD and adolescents exposed to PV, social problems, peer problems and academic impairments may be observed [19, 20]. It has been stated that young people with ADHD have difficulty interacting effectively with their peers, and this may cause them to be more rejected and bullied by young people with typically development [21]. Exposure of adolescents with ADHD to PV may exacerbate these problems. Studies examining the effects of ADHD on social problems, peer problems, academic problems in adolescents who are exposed to PV are also limited.

Within the framework of all these limitations in the literature, the aim of this study was to investigate the effect of ADHD on internalizing and externalizing behaviors, depression, academic problems in adolescents exposed to PV. Current study was planned to be conducted with ADHD participants exposed to PV, with participants without any psychiatric disorders and exposed to PV, and with participants without any psychiatric disorders and not exposed to PV.

Materials and Methods

Participants

In a study conducted by Malhi et al. on peer victimization among adolescents, the mean SDQ total score in adolescents without peer victimization was found to be 10.37 ± 4.83 [22]. In the power analysis ($\alpha = 0.05$, $1-\beta$ (power) = 0.95) performed considering this data, the mean SDQ total score of the adolescents who were not exposed to peer victimization was accepted as 10.37 ± 4.83 and the mean SDQ total score of the adolescents with ADHD who were exposed to peer victimization was predicted as 15. As a result of the power analysis, it was determined that at least 28 adolescents should be included in this study for each group.

Simple random sampling method was used in the present study and the study had a cross-sectional design. The present study was conducted with 169 adolescents aged

between 12-18. Participants in the study included 41 adolescents with ADHD and exposed to PV (ADHD-V group), and 69 adolescents without any psychiatric disorder and exposed to PV (Control-V group), and 59 adolescents without any psychiatric disorder and were not exposed to PV (Control-NV group). Olweus Bully/Victim Questionnaire was filled by all adolescents who applied to the child and adolescent psychiatry outpatient clinic between March and May 2022 and were diagnosed with ADHD according to the diagnostic criteria in DSM-V. The ADHD-PV group was consisted from the adolescents who were evaluated as victims according to the Olweus Bully/Victim Questionnaire. The control groups consisted of adolescents who applied to the pediatric outpatient clinic of the same hospital, who did not have a previous psychiatric application and who did not have any psychiatric complaints.

Written informed consent was obtained from all participants and their families. Socio-demographic Data Form, Olweus Bully/Victim Questionnaire Strengths and Difficulties Questionnaire-Adolescent Form, Children's Depression Inventory forms were filled out by all participants included in the study.

The aim and method of the study were explained in detail to the adolescents and their parents who participated in the study, and written consent was obtained from the adolescents and their parents. The study, approved by the KTO Karatay University Faculty of Medicine Ethical Committee for Non-Pharmaceutical and Non-Medical Device Researches (Date and report number: 2022/018), conducted its research following the principles of the Helsinki Declaration.

Measures

Socio-demographic data form

This form was designed by the authors. The form included questions regarding gender, age, family structure, family income, living area, literacy of the parents, whether they are absent without an excuse, whether they like school, whether they have been taken discipline punishment at school. Family income status was evaluated at three levels. The income level below the gross minimum wage was defined as low, between the gross minimum wage and twice the gross minimum wage was defined as medium, and over twice the gross minimum wage was defined as high.

Olweus Bully/Victim Questionnaire (OBVQ)

The questionnaire developed by Olweus consists of 39 questions, and questions 4- 13 of the questionnaire were used to determine the victim, while 24-33 were used to determine the bully [1]. Since exposure to PV was evaluated in current study, questions 4-13 of the scale, which is related to exposure to peer victimization were used. In order to designate an individual as a victim, the child or adolescent must have been exposed to bullying-related behaviors at least twice in a month. The Turkish validity and reliability study was conducted by Sipahi [23].

Types of victimization were examined as four types: verbal (called mean names, teasing, bullied with mean names or comments about his/her race or family), physical (being hit, kicked, pushed or damaged to his/her property),

relational (being left him/her out of things on purpose, excluded him/her from their group of friends, or completely ignored him/her) and reputational (being told lies or spread false rumors about his/her and tried to make others dislike his/her).

Strengths and difficulties questionnaire-adolescent form

This scale, which was developed by Goodman, is a self-report scale used to determine adolescents' competence areas and problem behaviors [24]. The scale consists of 5 sub-scales that evaluate positive and negative behaviors. These behaviors are: 1. Behavioral problems, 2. Attention deficit and hyperactivity, 3. Emotional problems, 4. Peer problems, 5. Social behaviors. Scores are obtained from each subscale of the scale. While high scores in social behavior reflect the individual's strengths in the social field; high scores in the other four domains (behavioral problems, inattention and hyperactivity, emotional problems, peer problems) reflect that the problem areas are severe. In addition, the sum of the scores of the other four subscales, excluding the social behavior subscale, gives the total difficulty score. Turkish validity and reliability study was carried out by Güvenir et al [24].

Children's depression inventory

This scale, which was developed by Kovasc on the basis of the Beck Depression Inventory, is used to evaluate depression in children aged 6-17 years. The scale consists of 27 items and for each item, there are options with 0, 1 or 2 points depending on the severity of the symptom. The Turkish reliability and validity analyze of the scale were performed by Öy, and scores of 19 and above are considered significant for major depression [25].

Statistical analysis

The Statistical Program for Social Sciences (SPSSSTM, IBM Inc., Armonk, NY) 22.0 program was used in the study. In descriptive qualitative data, number and percentage (%) were used and Chi-square test was used for the analysis of these variables. According to assessment using the Shapiro-Wilk normality test, it was determined that none of the quantitative variables showed normal distribution. In descriptive quantitative data, median and interquartile range was used and Kruskal Wallis test was used for the analysis of these variables. The hypothesis of this study is that SDQ and CDI mean scores are significantly higher in the Control-V group compared to the Control-NV group, and in the ADHD-V group compared to the Control-V group. The hypothesis of the study was evaluated with the Kruskal Wallis analysis and the significant difference between the groups was examined with the One Way Anova analysis. $p < 0.05$ value was considered statistically significant.

Results

The mean ages of the ADHD-V group ($n = 41$), Control-V group ($n = 69$) and Control-NV group ($n = 59$) were determined as 14.2 ± 1.74 , 14.9 ± 1.72 and 14.8 ± 1 years, respectively. There was no significant difference between groups in terms of age ($p = 0.132$). The ADHD-V group

consisted of 21 (51.2%) males and 20 (48.8%) females. The Control-V group consisted of 33 (47.8 %) males and 36 (52.2 %) females, and the Control-NV group consisted of 28 (47.5 %) males and 31 (52.5 %) females. There was no significant difference between groups in terms of gender ($p = 0.923$). In ADHD-V group, Control-V group and Control-NV group, the rates of the participants lived in the town center found as 78% ($n=32$), 72.5% ($n=50$) and 76.3% ($n=45$), respectively. In addition, low family income status of participants in ADHD-V group, Control-V group and Control-NV group were determined as 57.5% ($n=23$), 68.1% ($n=47$) and 62.7% ($n=37$), respectively. There was no statistically significant difference between groups in terms of sociodemographic characteristics. When asked whether they were absent from school except for compulsory situations, 36.6% ($n=15$) of the participants in the ADHD-V group answered yes, while this rate was 8.7% ($n=6$) and 1.7% ($n=1$) in the Control-V and Control-NV groups, respectively ($p=0.001$). In addition, 53.7% ($n=22$) of the participants in the ADHD-V group, 64.7% ($n=44$) of the participants in the Control-V group, 93.2% ($n=55$) of the participants in the Control-NV group stated that they liked school ($p = 0.000$). Moreover, it was determined that the participants in the ADHD-V group ($n=14$; 34.2%) were more likely to take disciplinary punishment in school than the participants in the Control-V ($n=17$; 24.6%) and Control-NV ($n=5$; 8.5%) groups ($p=0.006$). The sociodemographic characteristics of the participants were presented in Table 1.

The percentages of the participants who stated that they were exposed to verbal, physical, relational and reputational victimization are shown in Table 2. Adolescents in the ADHD group stated that they were most exposed to verbal ($n=25$; 61%) and reputational ($n=25$; 61%) victimization, while adolescents in the control group stated that they were most exposed to verbal victimization ($n=37$; 52.6%). It was also found that adolescents with ADHD were exposed to more reputational victimization ($p < 0.001$).

Table 3 showed the median scores and quartiles of the subscales of the SDQ and CDI score of the groups. SDQ total score and scores of subscales of SDQ (except social domain) were determined to be highest in ADHD-V group compared to the Control-V group and Control-NV group. The highest score in the social subscale of SDQ was determined in the Control-NV group. The highest score in the CDI scores were determined in the ADHD-V and Control-V group.

Discussion

The aim of this study was to evaluate the effect of ADHD on internalizing and externalizing behaviors, depression and academic problems of adolescents exposed to PV. Results showed that internalizing and externalizing behaviors, social problems, peer problems, and depressive symptoms were higher in adolescents who were bullied (both with and without ADHD) than adolescents who were not bullied. While it was determined that ADHD may be effective in the emergence of externalizing behaviors, it was found no effect on the emergence of internalizing behaviors. It was also found that ADHD had a greater effect on

Table 1. Demographic characteristics of participants.

Demographic characteristics		ADHD-V (n=41) Mean ± SD	Control-V (n=69) Mean ± SD	Control-NV (n=59) Mean ± SD	F	p
Age		14.25 (1.74)	14.94 (1.72)	14.86 (1.86)	2.052	0.132
		n (%)	n (%)	n (%)	X ²	p
Gender	Male	21 (51.2)	33 (47.8)	28 (47.5)	0.160	0.923
	Female	20 (48.8)	36 (52.2)	31 (52.5)		
Living area	Rural	9 (22)	19 (27.5)	14 (23.7)	0.491	0.782
	Urban	32 (78)	50 (72.5)	45 (76.3)		
Literacy of the mother	Primary school dropout	19 (46.3)	35 (50.7)	34 (57.6)	12.970	0.113
	Primary school	8 (19.5)	21 (30.4)	14 (23.7)		
	Middle school	3 (7.3)	9 (13)	4 (6.8)		
	High school- University	11 (26.8)	4 (4.9)	7 (11.9)		
Literacy of the father	Primary school dropout	6 (14.6)	16 (23.2)	11 (18.6)	6.949	0.542
	Primary school	15 (36.6)	28 (40.6)	28 (47.5)		
	Middle school	7 (17.1)	13 (18.8)	6 (10.2)		
	High school- University	13 (31.7)	12 (17.3)	14 (23.8)		
Family type	Nuclear family	33 (81.7)	58 (86.6)	56 (94.9)	2.649	0.266
	Extended family	3 (8.3)	9 (13.4)	3 (5.1)		
Socioeconomic status	Low	23 (57.5)	47 (68.1)	37 (62.7)	9.141	0.058
	Middle	10 (25)	49 (72.5)	20 (33.9)		
	High	7 (17.5)	3 (4.3)	2 (3.4)		
Unexcused absences	No	26 (63.4) ^a	63 (91.3) ^b	58 (98.3) ^b	27.93	<0.001
	Yes	15 (36.6) ^a	6 (8.7) ^b	1 (1.7) ^b		
Do you like school?	Dislike	6 (14.6) ^a	5 (7.4) ^a	2 (3.4) ^a	23.015	<0.001
	Neither like nor dislike	13 (31.7) ^a	19 (27.9) ^a	2 (3.4) ^b		
	Like	22 (53.7) ^a	44 (64.7) ^a	55 (93.2) ^b		
Disciplinary punishment	No	27 (65.8) ^a	52 (75.4) ^a	54 (91.5) ^b	10.284	0.006
	Yes	14 (34.2) ^a	17 (24.6) ^a	5 (8.5) ^b		

ADHD-V: adolescents with ADHD and exposed to peer victimization, Control-V: adolescents without any psychiatric disorder and exposed to peer victimization, Control-NV: adolescents without any psychiatric disorder and were not exposed to peer victimization.

Table 2. Types of victimization exposed by participants.

Types of victimization		ADHD-V (n=41) n(%)	Control-V (n=69) n(%)	Control-NV (n=59) n(%)	F	p
Verbal victimization	No	16 (39) ^a	32 (46.3) ^a	59 (100) ^b	53.122	<0.001
	Yes*	25 (61) ^a	37 (52.6) ^a	0 (0) ^b		
Physical victimization	No	24 (58.5) ^a	37 (53.6) ^a	59 (100) ^b	37.315	<0.001
	Yes*	17 (41.5) ^a	32 (46.4) ^a	0 (0) ^b		
Relational victimization	No	28 (68.3) ^a	48 (69.6) ^a	59 (100) ^b	22.855	<0.001
	Yes*	13 (31.7) ^a	21 (30.4) ^a	0 (0) ^b		
Reputational victimization	No	16 (39) ^a	45 (65.2) ^b	59 (100) ^c	45.584	<0.001
	Yes*	25 (61) ^a	24 (34.8) ^b	0 (0) ^c		

ADHD-V; adolescents with ADHD and exposed to peer victimization, Control-V; adolescents without any psychiatric disorder and exposed to peer victimization, Control-NV; adolescents without any psychiatric disorder and were not exposed to peer victimization. *Yes: Happened at least two times in a month.

absenteeism in school than PV.

The relation between PV and internalizing problems has been widely investigated over the last few decades. In a current meta-analysis study conducted by Christina et al. with 117,520 children and adolescents, it was determined that PV was a predictor factor and an outcome for internalizing symptoms [26]. It is stated that internalizing behaviors are behavioral expressions of deficiencies in emotion regulation [27], and previous studies have shown that there may be a bidirectional relation between emotion regulation deficits and PV [19, 28]. It has been showed that

emotion regulation deficiency is a potential risk factor for PV [19]. Children with emotional regulation deficiencies may be at high risk of being exposed to PV because in the presence of peer provocation, they fail to effectively cope with negative emotions, and exhibit emotionally erratic behavior [19]. Previous studies have also shown that peer victimization has predictive value for emotional problems [28]. The coexistence of ADHD and internalizing behaviors and emotion regulation deficits has been known for a long time [13, 29-31]. In fact, it is stated that approximately 45% of all children with ADHD experience signif-

Table 3. Differences in CDI scale and subscales of SDQ.

	ADHD-V1 Median (25-75 quartiles)	Control-V2 Median (25-75 quartiles)	Control-NV3 Median (25-75 quartiles)	p	Pairwise comparisons
CDI	20 (12.5-24)	18.5 (13.25-24)	6 (4-10)	<0.001	1=2>3
SDQ					
Emotional symptoms	5 (3-8)	4 (3-5)	1 (0-2)	<0.001	1=2>3
Conduct problems	4 (3-5)	3 (2-4)	1 (1-2)	<0.001	1>2>3
Hyperactivity/ inattention	7 (5-8)	4 (3-5)	2 (1-4)	<0.001	1>2>3
Peer relationship problems	4 (2-5)	3 (2-5)	2 (1-3)	<0.001	1=2>3
Prosocial behaviour	8 (7-9)	8 (7-9)	9 (8-10)	0.226	-
Total	19 (16-22)	15 (12-17)	7 (5-9)	<0.001	1>2>3

ADHD-V; adolescents with ADHD and exposed to peer victimization, CDI; Children’s Depression Inventory, Control-V; adolescents without any psychiatric disorder and exposed to peer victimization, Control-NV; adolescents without any psychiatric disorder and were not exposed to peer victimization, SDQ; Strengths and Difficulties Questionnaire-Adolescent Form.

icant impairment in emotion regulation, so emotion regulation deficits may be considered as an "cardinal symptom" of ADHD [17]. Therefore, emotional and internalizing symptoms are expected to be higher in children and adolescents with ADHD who are exposed to PV. Becker et al. found that the relationship between victimization and internalization problems in adolescents with ADHD varied according to victimization type, internalizing domain and gender [18]. However, in a 6-month longitudinal study conducted by Fogleman et al. with children, it was determined that peer victimization exposure of children with ADHD did not predict internalization behaviors [16]. In this study, it was determined that emotional problems and depression were statistically higher in adolescents exposed to peer victimization than in adolescents who were not exposed to peer victimization. Although the emotional problem subscale score and depression scores of the ADHD-V group were higher than those of the Control-V group, no statistically significant difference was found. These results suggest that the main role in the emergence of emotional problems in adolescents exposed to PV is to exposure of peer victimization. Adolescence is a period in which peer relationships come to the fore and friendships are more important for the individual. Exposure to PV appears to be an important risk factor for internalizing behaviors for all adolescents, whether or not they have ADHD.

Similar to internalizing problems, it has been determined that externalizing problems may be both antecedent and consequence of PV [32]. Hanish and Guerra revealed in their 2-year follow-up study with 1469 children that previous victimization predicted externalization problems [33]. In a meta-analysis, Kljakovic et al identified the externalizing behavior as a predictor for PV in adolescents [34]. However, Fogleman et al., determined no significant relations between externalizing behaviors and PV [16]. Exposure to PV may lead to greater externalizing behaviors by increasing the likelihood of outwardly directing negative emotions and displaying negative emotions in the presence of others [16]. In the current study, it was determined that externalization problems were more common in adolescents who are exposed to PV. In addition, the results showed that the behavioral problems of adolescents with ADHD who were exposed to PV were statistically

significantly higher than those without ADHD who were exposed to PV. The reason why externalizing behaviors are observed more frequently in children with ADHD who are exposed to peer victimization may be that externalizing behaviors are observed more frequently in children with ADHD and these children’s inability to cope with negative emotions [13, 19]. Children with ADHD who have difficulty in coping with negative emotions may exhibit more externalizing behavior in a stressful situation such as PV.

Previous studies have shown that academic variables are associated with both PV and ADHD. Children and adolescents with both ADHD and exposed to PV have been shown to be more likely to avoid school [35-37]. Jan and Husain, in their study of 234 adolescents aged 12-15, found that students who were bullied were more likely to be absent from school for fear of being criticized by their peers [38]. However, a limited number of studies found no association between PV and school absenteeism. In their study conducted with 3,530 children, Glew et al. demonstrated no significant relation between PV and school absenteeism [39]. In addition, Wolke et al, determined no association between PV and absenteeism [40]. In current study, no statistically significant difference was found in the Control-V group compared to the Control-NV group. Different results between studies may be due to methodological differences. In this study, absenteeism data was obtained by asking the participants whether they were absent from school without an excuse. Children exposed to PV may develop somatic and psychological problems and may have considered these problems as an excuse for absenteeism [41]. In ADHD-V group, absenteeism and disciplinary punishment were found to be statistically significantly higher. This situation may have arisen due to impulsive behaviors and externalizing behaviors observed more frequently in children and adolescents with ADHD. The most prevalent form of victimization determined in the current study was verbal and reputational victimization in ADHD-V groups and verbal victimization in the Control-V. Community-based studies have found that adolescents are exposed to relational and reputational victimization at a higher rate than physical victimization [18]. A study on adolescents with ADHD determined the most

prevalent form of victimization as relational victimization, followed by reputational victimization [18]. Chou et al., in their study with adolescents with ADHD, showed that exposure to passive (verbal, relational, reputational) victimization was higher than exposure to active victimization (physical) [42]. In current study, it was determined that adolescents with ADHD were more exposed to reputational victimization than the control group. Contrary to findings of this research, Orençül et al., in their study with children with ADHD, found that children with ADHD were more exposed to verbal, physical and relational victimization than the control group [43]. The difference between the two studies may be due to the different age range of the sample group included in the studies. Xie et al. state that reputational victimization damages the broader reputation socially, while relational victimization damages the individual through an existing relationship [44]. As bullying and externalizing behaviors are more common in individuals with ADHD, the adolescent who bullies an adolescent with ADHD may prefer indirect reputational bullying instead of direct bullying behaviors such as physical or verbal.

The current study had some potential limitations. The study design was cross-sectional, and had a limited sample size. For these reasons, the findings of the study could not be adapted to the general population. In addition, no scale was used for the diagnosis of ADHD, and the inability to distinguish between diagnostic subtypes of ADHD is another limitation. Another limitation was that scale was used to detect internalizing and externalizing problems. In addition, one of the other limitation of the study was that the scales used were self-report questionnaires, which could lead to socially desirable responses and reporting bias. Despite these limitations, the fact that this study was conducted with ADHD participants who were exposed to PV, participants who did not have any psychiatric disorder and were exposed to PV, and participants who did not have any psychiatric disorder and were not exposed to PV constituted the strengths of this study. In addition, in present study, internalizing behaviors, externalizing behaviors and academic problems were evaluated together.

Conclusion

In conclusion, current study demonstrated that adolescents exposed to peer victimization exhibited more internalizing and externalizing behaviors and experienced more academic problems. In addition, it has been determined that if the adolescent exposed to PV has comorbid ADHD, they have more severe externalizing behaviors, they are more absent from school and they receive more disciplinary punishment. Therefore, it is important to prevent PV in schools and to treat adolescents with ADHD effectively. Therefore, it is important to determine whether there is a comorbid ADHD in adolescents exposed to PV. Further longitudinal studies with larger samples are needed to elucidate the association between ADHD and peer victimization.

Ethics approval

The study, approved by the KTO Karatay University Faculty of Medicine Ethical Committee for Non-

Pharmaceutical and Non-Medical Device Researches (Date and report number: 2022/018), conducted its research following the principles of the Helsinki Declaration.

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