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## Childhood abuse and neglect in adult attention-deficit/hyperactivity disorder

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### ABSTRACT

**Objective:** Although it has been suggested that attention-deficit/hyperactivity disorder (ADHD) is common in children who were abused and that ADHD can be a risk factor for abuse itself, there are very few studies which investigated whether adult ADHD is associated with childhood abuse and neglect. The aim of this study was to fill this gap in the literature.

**Method:** Seventy adults with DSM-IV ADHD diagnosis and 70 healthy control subjects were included in the study. We used Adult ADHD Self Rating Scale (ASRS) and Wender Utah Rating Scale (WURS) to support the diagnosis. All subjects were assessed using Childhood Trauma Questionnaire (CTQ), Adverse Childhood Experiences (ACE) Scale, Post-traumatic Stress Disorder Checklist (PCL), Dissociative Experiences Scale (DES), and Symptom Checklist-90-Revised.

**Results:** ADHD subjects had higher ASRS inattentiveness, hyperactivity/impulsivity, WURS, and Symptoms Checklist-90 (SCL-90) General Symptom Index scores than controls. ADHD group also had higher PCL, DES and ACE scores. In CTQ, ADHD subjects had higher emotional abuse and neglect scores than control subjects. ASRS and WURS scores were correlated with PCL, ACE, CTQ Emotional Abuse, and DES scores; WURS score was also correlated with CTQ Physical Abuse and Neglect scores. Regression analysis indicated that general level of psychopathology was most significantly associated with DES and PCL scores.

**Conclusions:** Results suggested that ADHD cases were more commonly exposed to emotional abuse and neglect. They had significantly more dissociative experiences and reported Post-traumatic Stress Disorder (PTSD) symptoms more frequently. The results pointed to the importance of childhood traumatic and adverse experiences in adults with ADHD.

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### KEYWORDS

Emotional abuse; neglect; attention-deficit/hyperactivity disorder; childhood trauma; dissociation; adverse event

## Introduction

Attention-deficit/hyperactivity disorder (ADHD) is one of the most common psychiatric disorders of childhood and frequently continues into adulthood. Adult ADHD leads to functional impairments in several areas, including academic, social, and interpersonal ones. Several studies have suggested that Post-traumatic Stress Disorder (PTSD) symptoms and dissociative experiences are more common in individuals with ADHD. It has been shown that ADHD symptoms can emerge after traumatic experiences in children [1,2] although it is difficult to distinguish ADHD from dissociative symptoms [3] and PTSD [4].

Dissociative symptoms may also be risk factors for later attention problems in children who were abused [5]. To a lesser extent, ADHD is associated with traumatic experiences itself. In a population study, it has been reported that ADHD Inattentive type was associated with physical neglect, physical abuse, and contact sexual abuse, while Hyperactive type was associated with physical abuse [6]. In a more

recent study, ADHD subjects were reported to be more likely to suffer emotional neglect [7]. On the other hand, only a very few studies have investigated the association of adult ADHD with childhood traumatic and adverse experiences. In one study, investigators have shown that emotional abuse and neglect were more common among all subjects with ADHD while sexual abuse and physical neglect were more common in females with ADHD [8]. It has also been reported that childhood ADHD symptoms were associated with dissociative symptoms in adulthood [9].

The aims of the present study were to investigate (1) whether adverse childhood experiences (ACE) and childhood trauma, including emotional and physical neglect and abuse, were more common in adults with ADHD when compared with healthy controls; (2) whether adult ADHD ratings were associated with adverse and traumatic childhood experiences and current PTSD and dissociative symptoms and general psychopathology. Our hypotheses were in the affirmative for both questions.

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## Methods

### Study sample

Our sample included 70 adult cases with ADHD (42 males, 60%; mean age:  $29.8 \pm 8.3$  years), and 70 healthy controls (34 males, 49%; mean age:  $30.4 \pm 9.2$  years). Of 103 ADHD patients, who were consecutively admitted to Adult ADHD Program at a tertiary care Psychiatry Research Hospital during a 6-month study period, 70 were willing and suitable to participate in the study. All cases were diagnosed by means of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) ADHD criteria. An ADHD diagnosis was ascertained by administration of a structured DSM-IV symptom checklist. For dimensional ADHD measures, the Wender Utah Rating Scale (WURS) and Adult ADHD Self Rating Scale (ASRS) were obtained. Protocol for this research project was approved by the local ethics committee. Written informed consents were obtained from ADHD and healthy subjects prior to study participation.

### Instruments

*Wender Utah Rating Scale* (WURS) [10] is a self-report assessment tool with 61 items, for which adults rate the presence of symptoms of childhood ADHD as “not at all or very slight,” “mild,” “moderate,” “quite a bit,” or “very much.” Twenty-five of these items are most helpful in separating ADHD subjects from normal controls. WURS was translated to Turkish by Oncu et al. [11] and the Turkish form has adequate validity and reliability (Cronbach’s alpha 0.88). The WURS evaluates past ADHD symptoms and childhood history of ADHD while the *Adult ADHD Self Rating Scale* (ASRS) gives information on the current problems of the individual. Combination of WURS and ASRS is recommended for a better evaluation of adult ADHD [12].

*Childhood Trauma Questionnaire – Short Form* (CTQ-SF) [13] is a 28-item self-report instrument for adults and adolescents that assesses retrospective child abuse and neglect. The CTQ-SF was developed from an initial 70-item version developed by Bernstein et al. [14]. The length of the scale was reduced from 70 to 28 items based on exploratory and confirmatory factor analyses. The CTQ-SF assesses the following five types of maltreatment: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Each scale is represented with five items that are scored on a 5-point Likert-type scale ranging from never true to very often true. Three additional items compose the minimization scale for detecting socially desirable responses or false negative trauma reports. The internal consistency coefficients of the English version ranged from 0.84 to 0.89 for emotional

abuse, 0.81–0.86 for physical abuse, 0.92–0.95 for sexual abuse, 0.85–0.91 for emotional neglect, and 0.61–0.78 for physical neglect [15]. The five-factor structure of the CTQ-SF was maintained across clinical and non-referred samples. The results of confirmatory factor analyses indicated a good and acceptable fit of the five-factor model [15]. The Turkish version of the CTQ is reliable and valid as its original form [16].

*The Adverse Childhood Experiences Questionnaire* (ACE) is a reliable, valid, and economic screen for the retrospective assessment of ACEs [17,18]. It consists of 10 items each of which measures one type of childhood trauma. Five are personal: physical abuse, verbal abuse, sexual abuse, physical neglect, and emotional neglect. Five are related to other family members: a parent who’s an alcoholic, a mother who’s a victim of domestic violence, a family member in jail, a family member diagnosed with a mental illness, and the disappearance of a parent through divorce, death, or abandonment. Each type of trauma counts as one. The number of categories of ACEs is added up for each person to produce the ACE Score (range: 0–10). An ACE Score of 0 means that none of the categories were reported while an ACE Score of 5 means that the person reported 5 categories of ACEs. So a person who’s been physically abused, with one alcoholic parent, and a mother who was beaten up has an ACE score of three. One recent study has found that the ACE has a satisfying internal consistency and high correlations with the CTQ [18].

Psychological distress of the participants was evaluated by Turkish version [19] of the *Symptoms Checklist-90-Revised* (SCL-90-R) [20]. The SCL-90-R is a 90-item self-reporting symptom inventory measuring current psychological symptom status during the past 7 days including today. Each item is rated on a 5-point scale of distress, ranging from 0 (not at all) to 4 (extremely). The 90 items of the test are summarized into 10 domains (somatization, obsessive compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and various symptoms), and into a General Symptom Index (GSI), which is used as an indicator of the overall psychological distress. A value  $\geq 1$  in GSI or in any specific subscale is suggestive of psychopathology (1.00–1.49, mild; 1.50–1.99, moderate;  $\geq 2.00$ , severe). More than 1000 studies have been conducted demonstrating the reliability, validity, and utility of the instrument.

*PTSD Check List – Civilian Version* (PCL-C) is a 17-item self-report checklist of PTSD symptoms based closely on the DSM-IV criteria and takes 5–7 minutes to complete. Respondents rate each item from 1 (“not at all”) to 5 (“extremely”) to indicate the degree to which they have been bothered by that particular symptom over the past month. There are slightly different versions for use with military (M) or civilian

(C) populations, as well as a version focused on a “specific stressful experience” (S). The PCL has demonstrated strong psychometric properties [21]. The Turkish version of PCL-C was found to be useful for the diagnosis and assessment of severity of PTSD. It was valid and had high internal consistency and good diagnostic performance for cut-off points between 22 and 24. For these cut-off points, both sensitivity and specificity were over 70%. Cronbach’s alpha of PCL-C was 0.922. Total PCL-C score and intrusion, hyperarousal, avoidance subscale scores were found to be highly correlated with the corresponding scores of the clinician-administered PTSD scale [22].

### Statistical analysis

Clinical data were expressed as percentages or mean values  $\pm$  standard deviation. Comparisons of demographic and clinical data were made with analysis of variance for continuous variables and chi-square analysis for nominal data. Correlation of clinical characteristics was computed using Pearson’s correlation. Multiple linear regression analyses were used to identify factors independently associated with general psychopathology. The level of significance for all analyses was set at 0.05. SPSS version 16.0 for Windows (SPSS, Chicago, IL, U.S.A.) was used for all the analyses.

### Results

ADHD and control groups were similar in terms of age (ADHD:  $29.8 \pm 8.3$  years vs. Control:  $30.4 \pm 9.2$  years;  $F = 1.7$ ,  $p = .18$ ), gender ( $\chi^2 = 1.84$ ,  $p = .17$ ), and education ( $\chi^2 = 2.60$ ,  $p = .27$ ). As expected, ADHD group had significantly higher ASRS and WURS scores than healthy controls (Table 1).

**Table 1.** Comparison of clinical characteristics of sample groups.

Clinical characteristics	ADHD group ( <i>n</i> = 70)	Control group ( <i>n</i> = 70)	<i>F</i> (1,139); <i>p</i>
Age	29.8 $\pm$ 8.3	30.4 $\pm$ 9.2	1.7; .18
PCL	40.0 $\pm$ 15.7	27.3 $\pm$ 13.1	27.0; <.001
ACE	2.1 $\pm$ 2.4	1.3 $\pm$ 1.8	6.3; .013
ASRS Inattentiveness	18.4 $\pm$ 6.0	5.7 $\pm$ 4.0	212.7; <.001
ASRS Hyperactivity/ Impulsivity	28.4 $\pm$ 9.3	5.9 $\pm$ 2.4	384.1; <.001
WURS	49.8 $\pm$ 15.1	14.1 $\pm$ 4.3	364.9; <.001
CTQ Emotional abuse	8.9 $\pm$ 3.3	6.8 $\pm$ 2.7	16.2; <.001
CTQ Physical abuse	6.6 $\pm$ 2.5	5.9 $\pm$ 2.4	2.9; .09
CTQ Emotional neglect	11.8 $\pm$ 4.5	9.8 $\pm$ 4.7	6.2; .014
CTQ Physical neglect	6.6 $\pm$ 2.2	6.1 $\pm$ 2.3	1.8; .18
CTQ Total	48.7 $\pm$ 9.4	45.7 $\pm$ 10.0	3.3; .07
DES	17.5 $\pm$ 16.0	8.7 $\pm$ 14.6	11.8; .001

Notes: ADHD, Attention-Deficit Hyperactivity Disorder; PCL, Post-traumatic Stress Disorder Checklist; ACE, Adverse Childhood Experiences Scale; ASRS, Adult ADHD Self Rating Scale; WURS, Wender Utah Rating Scale; CTQ, Childhood Trauma Questionnaire; DES, Dissociative Experiences Scale.

ADHD group also had higher ACE, PCL, and Dissociative Experiences Scale (DES) scores. When the CTQ scores were compared, ADHD group had higher CTQ Emotional Abuse and Emotional Neglect scores. Correlation analysis indicated that ASRS Hyperactivity/Impulsivity score was significantly correlated with CTQ Emotional Abuse ( $r = 0.33$ ,  $p < .001$ ) and Emotional Neglect ( $r = 0.27$ ,  $p = .001$ ) scores as well as DES ( $r = 0.36$ ,  $p < .001$ ), PCL ( $r = .42$ ,  $p < .001$ ), and ACE ( $r = 0.25$ ,  $p = .002$ ) scores. ASRS Inattentiveness score was associated with CTQ Emotional Abuse ( $r = 0.26$ ,  $p = .002$ ), DES ( $r = 0.26$ ,  $p < .002$ ), and PCL ( $r = 0.36$ ,  $p < .001$ ) scores. On the other hand, higher WURS score was associated with higher PCL ( $r = 0.41$ ,  $p < .001$ ) and ACE scores ( $r = 0.20$ ,  $p = .02$ ) (Table 2). DES and PCL scores were also significantly correlated with CTQ and ACE scores (Table 3).

Effect on General Psychopathology: We conducted multiple linear regression analysis with SCL-90 General Psychopathology score as the dependent variable and age, gender, ASRS Inattentiveness, ASRS Hyperactivity/Impulsivity, DES, PCL scores and CTQ Emotional Abuse, Physical Abuse, Emotional Neglect, and Physical Neglect as independent variables. Regression analysis indicated that while SCL-90 General Psychopathology score increased significantly with increasing ASRS Hyperactivity/Impulsivity score, this was not significant after DES and PCL scores

**Table 2.** Correlations between clinical measurements and symptom severity of ADHD.

Clinical measurements	ASRS Inattentiveness	ASRS Hyperactivity/ Impulsivity	WURS ( <i>r</i> , <i>p</i> )
CTQ Emotional abuse	0.26; 0.002	0.33; <0.001	0.35; <.001
CTQ Emotional neglect	0.16; 0.06	0.27; 0.001	0.17; .05
CTQ Physical abuse	0.15; 0.08	0.14; 0.09	0.17; .04
CTQ Physical neglect	−0.07; 0.44	−0.10; 0.20	−0.06; .47
CTQ Total	0.11; 0.19	0.16; 0.06	0.20; .02
DES	0.26; 0.002	0.36; <0.001	0.34; <.001
PCL	0.36; <0.001	0.42; <0.001	0.41; <.001
ACE	0.15; 0.07	0.25; 0.002	0.20; .02

Notes: ASRS, Adult ADHD Self Rating Scale; CTQ, Childhood Trauma Questionnaire; DES, Dissociative Experiences Scale; PCL, Post-traumatic Stress Disorder Checklist; ACE, Adverse Childhood Experiences Scale.

**Table 3.** Correlations between childhood trauma and dissociative and PTSD symptoms.

Trauma measurements	DES	PCL
CTQ Emotional abuse	0.46	0.45
CTQ Emotional neglect	0.20*	0.34
CTQ Physical abuse	0.30	0.43
CTQ Physical neglect	0.33	0.38
CTQ Total	0.37	0.37
ACE	0.32	0.32

Notes: All  $p < .001$  except \*, in which  $p = .015$ .

DES, Dissociative Experiences Scale; PCL, Post-traumatic Stress Disorder Checklist; CTQ, Childhood Trauma Questionnaire; ACE, Adverse Childhood Experiences Scale.

**Table 4.** Multiple linear regression analysis.

Coefficients	<i>B</i>	<i>t</i>	<i>p</i>
Age	0.010	0.178	.859
Gender	0.036	0.679	.499
ASRS Inattentiveness	0.012	0.158	.875
ASRS Hyperactivity/Impulsivity	0.110	10.314	.191
PCL	0.425	50.667	.000
DES	0.358	50.192	.000
CTQ Emotional abuse	0.092	10.432	.155
CTQ Physical abuse	0.028	0.440	.661
CTQ Emotional neglect	-0.103	-10.641	.103
CTQ Physical neglect	0.068	10.041	.300

Notes: ASRS, Adult ADHD Self Rating Scale; PCL, Post-traumatic Stress Disorder Checklist; DES, Dissociative Experiences Scale; CTQ, Childhood Trauma Questionnaire.

were added to the model. Overall, the final model explained .63 of the total variance of SCL-90 General Psychopathology score with DES and PCL scores explained 45% of the variance (Table 4).

## Discussion

Results of the present study showed that adult ADHD subjects reported more frequent ACEs and more common emotional abuse and neglect during their childhood. Dissociative symptoms and symptoms associated with PTSD were also more common in the ADHD group. Childhood emotional abuse, dissociative and PTSD symptoms were associated with both inattentiveness and hyperactivity/impulsivity. On the other hand, only hyperactivity/impulsivity was significantly associated with ACEs and childhood emotional neglect. Childhood physical abuse and neglect were not more common in adult subjects with ADHD. Besides, ADHD scale scores were not significantly correlated with history of physical abuse and neglect.

Our results clearly showed that adult ADHD symptoms were associated with ACEs and emotional neglect and abuse. This was consistent with previous studies conducted with children [7] and adults [8]. Since there has been very few studies investigating the association of adult ADHD with ACEs, the present study provided important data. It was also interesting to reach similar results with studies conducted in other cultures, suggesting that the association between emotional neglect and abuse might be universal.

We did not find any significant associations between physical abuse and adult ADHD. However, we did not compare ADHD subgroups and some authors suggested that subtype of ADHD may also be an important factor [6].

The relationship between ADHD and traumatic experiences are complex. Traumatic experiences may lead to ADHD symptoms [1,2], although it is difficult to distinguish ADHD from dissociative symptoms [3] and PTSD [4]. Consistent with these latter studies, we found that PTSD symptoms and dissociative symptoms were more common in adults with ADHD when compared with healthy controls. Besides, as expected,

ACEs and history of childhood abuse and neglect were associated with adulthood PTSD and dissociative symptoms. Obviously, it is impossible to investigate causality in a case-control study. On the other hand, even using a longitudinal design, it may be a difficult task to disentangle individual symptoms and symptom groups which can be associated with different diagnosis, since the aetiology and pathophysiology of ADHD is not clear and the diagnosis is descriptive. Therefore, currently it is difficult to differentiate “true” ADHD cases from subjects showing ADHD symptoms due to traumatic experiences or other reasons (e.g. phenocopies). Another possibility is that dissociative symptoms may mediate the relationship between traumatic experiences and attention problems. In fact, it has been shown that abused children who later develop attention problems have more common dissociative symptoms [5]. To make causality claims even more complex, it has also been reported that childhood ADHD symptoms were associated with dissociative symptoms in adulthood [9]. In summary, there are several possible ways to explain the association of childhood trauma and adverse experiences with dissociative symptoms and ADHD.

Our results suggested that overall level of psychopathology was most significantly affected by dissociative and PTSD symptoms in adults with ADHD. Hyperactivity/impulsivity symptoms also had a more significant effect on general psychopathology than inattentiveness symptoms. Childhood traumatic experiences did not contribute to general level of psychopathology when dissociative and PTSD symptoms were controlled. These results suggested that clinicians should evaluate dissociative and PTSD symptoms in adult subjects with ADHD since these symptoms significantly increase general level of psychopathology in these group of individuals.

The results must be interpreted in the light of the limitations of the study. First of all, as explained before, a case-control design is not adequate to indicate causality. Second, as childhood adverse experiences and trauma were evaluated retrospectively, they were open to several biases. On the other hand, there were important strengths of the study, including the detailed clinical assessment of the subjects and we believe it contributed significantly to the literature.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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