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Research Paper

Childhood trauma, dissociative experiences and ADHD symptoms in youth

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ABSTRACT

Background: Trauma exposure and dissociative experiences can resemble attention-deficit/hyperactivity disorder (ADHD) symptoms in youth, but it is unclear whether dissociation explains trauma-related attentional symptoms by diagnostic status.

Methods: We enrolled 108 youth aged 12-18 years (54 with ADHD; 54 controls) from a child and adolescent psychiatry outpatient service in Türkiye. Youth completed the Childhood Trauma Questionnaire (CTQ) and Adolescent Dissociative Experiences Scale (A-DES); parents completed the Conners Parent Rating Scale-Revised Short Form (CPRS-RS). We estimated a multigroup path model (ADHD vs. control) testing CTQ→A-DES (path a), A-DES→CPRS-RS (path b), and CTQ→CPRS-RS (path c′), with 1000-draw bootstrap confidence intervals, adjusting for sex, internalizing symptoms, socioeconomic status, and number of children in the household. Indirect effects were interpreted as associational.

Results: In controls, higher trauma was associated with higher dissociative experiences ($a = 0.529$, p=.005), and higher dissociative experiences were associated with ADHD-like symptoms ($b = 0.292$, p<.001). The indirect effect was significant ($a \times b = 0.155$, 95% CI 0.035–0.306; p=.019). In the ADHD group, path a (0.163, p=.153), path b (0.107, p=.230), and the indirect effect (0.017, 95% CI -0.022 to 0.061; p=.380) were not significant. Indirect effects differed between groups (Wald $\chi^2(1)=4.54$, p=.033).

Conclusions: Dissociative experiences were associated with trauma-related ADHD symptoms in youth without ADHD, but this pathway was not statistically supported in diagnosed ADHD, supporting trauma-informed assessment when attentional complaints arise without confirmed ADHD.

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental condition in youth, characterized by developmentally inappropriate inattention and/or hyperactivity-impulsivity that impairs functioning across settings (American Psychiatric Association [APA], 2022, 2025; Ayano et al., 2023; Faraone et al., 2015). Yet, attentional complaints in youth are diagnostically heterogeneous: similar behaviors may arise from neurodevelopmental liability, trauma-related processes, or both (Boodoo et al., 2022; Ford, 2018; Szymanski et al., 2011). This heterogeneity creates a central clinical challenge, distinguishing primary ADHD from trauma-linked ADHD-like presentations.

Childhood maltreatment is consistently associated with elevated ADHD symptoms and ADHD diagnoses (Stern et al., 2018; Turner et al., 2009), but the mechanism remains debated. One account frames ADHD as primarily neurodevelopmental and trait-like, with adversity acting mainly as a comorbid or exacerbating influence (Faraone & Larsson, 2018; Nikolas & Burt, 2010). A trauma-informed account instead proposes that trauma-related dissociative processes can generate ADHD-like attentional phenotypes without diagnostic equivalence (Ford, 2018; Putnam, 1997; Szymanski et al., 2011).

Dissociation is central to this differential question. Trauma exposure is robustly associated with dissociative symptoms, especially under early, chronic, and interpersonal adversity (Brand & Frewen, 2017; Vonderlin et al., 2018). In youth, dissociation often presents as absorption, spacing out, and intermittent memory discontinuities, phenomena that can be interpreted as inattention or executive dysfunction (Sar, 2020; Silberg & Dallam, 2022; Soffer-Dudek & Somer, 2023; Theodor-Katz & Soffer-Dudek, 2025). Conceptual trauma models further suggest that these attentional disruptions are often state-dependent (fluctuating with internal defensive activation) rather than trait-like, and therefore may mimic ADHD at the symptom level while differing in underlying process (Nijenhuis, 2015, 2017; Putnam, 1997). Although not framed as a dissociation-specific account, Ford (2018)

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conceptualizes posttraumatic stress disorder as involving involuntary immersion in threat processing combined with diminished executive and self-referential regulation, a configuration that may produce fluctuating attentional engagement. Related frameworks of post-traumatic attentional dysregulation similarly describe involuntary attentional capture by internal threat-related cues, reduced goal-directed shifting, and variable cognitive engagement, all of which can complicate differential diagnosis in trauma-exposed youth (Szymanski et al., 2011).

Accordingly, we explicitly contrast two competing models. In a neurodevelopmental ADHD model, attentional dysfunction is expected to reflect relatively stable trait liability, with trauma exerting limited indirect influence through dissociative processes. In a trauma-dissociation model, trauma-related dissociative experiences are expected to account for a meaningful portion of ADHD symptom variance, especially among youth without a confirmed ADHD diagnosis (Faraone & Larsson, 2018; Faraone et al., 2015; Nijenhuis, 2015, 2017; Putnam, 1997). Prior studies have largely documented co-occurrence among trauma, dissociation, and ADHD symptoms, but have less often tested whether dissociation statistically accounts for trauma-related variance in ADHD-like symptoms, and whether this pathway differs by diagnostic status (Endo et al., 2006; Fragkaki et al., 2019; Kandeğer et al., 2021, 2022; Matsumoto & Imamura, 2007). Adolescence is an especially informative period for this test, given increasing stress exposure, improved self-report capacity relative to childhood, and ongoing maturation of regulatory systems that may amplify symptom overlap (Costello et al., 2002; Kochel et al., 2012; Sar, 2020).

To address these gaps, we estimated a multi-group path model in youth with clinician-confirmed ADHD and typically developing controls. Childhood trauma was modeled as the predictor, dissociative experiences as the intermediary variable, and ADHD symptom severity as the outcome, with key sociodemographic factors and internalizing symptoms included as covariates. We examined whether childhood trauma was associated with ADHD symptom severity indirectly through dissociative experiences, and whether this indirect pathway differed across groups. Our approach was explicitly associational rather than causal: indirect effects were interpreted as partitioned shared variance, not developmental mediation, given the cross-sectional design (Maxwell et al., 2011). Based on trauma-dissociation models and differential-diagnosis frameworks, we hypothesized that (1) trauma would show a stronger association with dissociative experiences in controls than in youth with ADHD; (2) dissociative experiences would show a stronger association with ADHD-like symptoms in controls; (3) the trauma→dissociation→ADHD indirect effect would be significant in controls; and (4) this indirect effect would be attenuated or absent in the ADHD group. By directly comparing pathway patterns across diagnostic groups, the study seeks to explore a clinically relevant distinction: when attentional complaints in youth may be more closely associated with trauma-linked dissociative processes versus core neurodevelopmental ADHD liability.

Method

Study design and setting

We conducted a cross-sectional case-control study at the Child and Adolescent Psychiatry Outpatient Clinic of Bezmialem Vakif University Faculty of Medicine, İstanbul, Türkiye. This study was conducted according to the Declaration of Helsinki guidelines, and was approved by the Institutional Review Board (No: E-35,700,536-108.99–151,880). Written informed consent was obtained from parents and assent from adolescents before participation. The study was not preregistered because preregistration was not standard in our workflow at the time of study conception. Reporting followed quantitative transparency recommendations, including explicit reporting of exclusions, sample determination, and measurement selection (Appelbaum et al., 2018; Simmons et al., 2012).

Participants/Procedure

Participants were 108 adolescents aged 12–18 years (M = 14.44 years, SD = 1.86). Youth were recruited through clinic and community referral pathways (eg, pediatricians, psychotherapists, teachers, and self-referral). The clinic is a specialized child and adolescent psychiatry service in central İstanbul. Assessments were completed in a quiet private room under standardized outpatient conditions. Adolescents completed self-report measures of childhood trauma (CTQ) and dissociative experiences (A-DES). Parents independently completed a parent-report measure of youths' attention and behavioral functioning (CPRS-RS). Clinicians provided only standard administration instructions and monitored testing conditions; they did not read items aloud, explain item content, or influence responses.

Group assignment

Eligibility was determined through comprehensive clinical assessment of adolescents and accompanying parents. ADHD group (n = 54): inclusion required (1) referral for attention/hyperactivity-impulsivity difficulties; (2) DSM-5 ADHD diagnosis established by a child and adolescent psychiatrist using K-SADS-PL-DSM-5, based on separate parent and adolescent interviews and integration across home and school contexts; (3) no indication of intellectual disability based on clinical evaluation, developmental history, academic functioning, and school records (standardized IQ testing was not administered); and (4) no psychotic disorder, major neurological impairment, or other severe psychiatric condition based on clinical interview and relevant K-SADS modules. Teacher input (brief phone-based school-functioning information and Conners Teacher Rating Scale) was used to support diagnostic formulation.

Control group (n = 54): inclusion required (1) no current or lifetime psychiatric diagnosis on K-SADS-PL-DSM-5 (parent and adolescent interviews), and (2) parent-reported developmental history within normal limits. Controls were recruited from community schools, family acquaintances of referred youth, and related community sources. Exclusion criteria were (a) a history of significant neurological, sensory, or motor impairments, (b) a history of seizure disorders, (c) psychosis, or (d) intellectual disability.

Measures

Psychiatric diagnosis

The Kiddie Schedule for Affective Disorders and Schizophrenia - Present and Lifetime Version for DSM-5 (K-SADS-PL-DSM-5; Kaufman et al., 2016) is a semi-structured clinical interview to assess current and lifetime psychopathology in children and adolescents aged 6–18 years, according to DSM-5 criteria. This instrument evaluates a wide spectrum of psychopathology, including mood disorders, psychotic disorders, anxiety disorders, externalizing disorders, disruptive behavior disorders, attention-deficit/hyperactivity disorder, substance use disorders, eating disorders, and tic disorders. The interview modules consist primarily of yes/no screening questions, followed by additional symptom lists with severity ratings administered when symptoms are identified. Assessment is based on information obtained from separate interviews with the child and the parent/guardian, which are then integrated to ensure a comprehensive and reliable evaluation of symptoms. Psychometric properties of the K-SADS-PL-DSM-5 have been well established within the Turkish population (Unal et al., 2019).

Attention-Deficit/Hyperactivity disorder symptoms

The Conners Parent Rating Scale-Revised Short (CPRS-RS; Conners et al., 1998) is a parent-report scale that assesses behavioral and emotional problems in children and adolescents, particularly symptoms of attention-deficit/hyperactivity disorder (ADHD) over the past month. The scale consists of 27 items rated on a four-point Likert-type scale (0 =

"never", 1 = "sometimes", 2 = "often", and 3 = "very often"). Higher scores indicate greater symptom severity. Items are grouped into three subscales: oppositional, inattention/cognitive problems, and hyperactivity. The Turkish adaptation of the CPRS-RS has demonstrated reliable psychometric properties (Kaner et al., 2013). The CPRS-RS demonstrated excellent internal consistency with a Cronbach's alpha of 0.97 for this study.

Childhood trauma

The Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 1994) is a 28-item self-report questionnaire that assesses emotional, physical, and sexual abuse, as well as emotional and physical neglect. In this study, the Turkish adaptation of the expanded version, CTQ-33 (Şar et al., 2020), was used, which includes an additional subscale measuring overprotection/overcontrol by caregivers. Items are rated on a five-point Likert scale (1 = "never true" to 5 = "very often true"), with subscale scores ranging from 5 to 25 and total scores from 30 to 150. Higher scores indicate greater maltreatment. The scale also includes a three-item minimization/denial subscale to detect underreporting. The Turkish version of the CTQ-SF has demonstrated strong psychometric properties (Sar et al., 2020). The CTQ-SF demonstrated good internal consistency with a Cronbach's alpha of 0.85 for this study.

Dissociative experiences

The Adolescent Dissociative Experiences Scale (A-DES; Armstrong et al., 1997) is a self-report assessment utilized to assess dissociative experiences in adolescents aged 11 to 17. This 30-item instrument evaluates a broad spectrum of dissociative experiences, including dissociative amnesia; absorption and imaginative involvement; passive influence; and depersonalization, and derealization. Each item is rated on an 11-point Likert scale (0 = "never" to 10 = "always") providing a detailed profile of dissociative symptom frequency. The Turkish adaptation of the A-DES was carried out by Zoroglu et al. (2002). The ADES demonstrated excellent internal consistency with a Cronbach's alpha of 0.93 for this study.

Covariates

To control for factors that might bias the estimates, a set of socioeconomic and demographic characteristics of youth and families that have been theoretically or empirically linked with the main study variables was used as control variables drawing upon previous studies and were further informed by significant group differences and bivariate correlations observed in preliminary analyses. These covariates encompassed child sex (Gershon, 2002; Tam et al., 2024) (0 = boy, 1 = girl), number of siblings at home (Reimelt et al., 2021), socioeconomic status (SES; Russell et al., 2016). To control for current depression and anxiety symptoms, Revised Child Anxiety and Depression Scale-Child Version (RCADS; Chorpita et al. 2000) for Turkish population (Gormez et al., 2017) was used, with higher scores indicating greater symptomatology (Cronbach's $\alpha = 0.94$).

Analysis plan

We specified a multi-group path model in which each group (ADHD vs. control) had identical paths but was estimated separately. In both groups, childhood trauma (CTQ) served as the exogenous predictor, dissociative experiences (ADES) as the intermediate variable, and ADHD symptoms (Conners) as the outcome. In each group, we specified three key paths: a path from CTQ to ADES (Path a), a path from ADES to Conners (Path b), and a direct path from CTQ to Conners (Path c′). The indirect effect was defined as the product of Path a and Path b, and the total effect (c) as the sum of the direct (c′) and indirect effects. Parameter estimates were freely estimated in each group (denoted as a_1, b_1, c_1 in the ADHD group and a_2, b_2, c_2 in the control group), with bootstrap estimates generated to ensure robust inferences regarding the indirect effects. This configuration enabled us to evaluate whether the path associations operated similarly or differentially between the ADHD and control groups, with all pathway estimates interpreted as overlapping variance among the variables rather than causal processes. Groups were expected to differ on mean levels of trauma, dissociation, and ADHD symptoms. A multi-group path model was therefore used not to equate the groups, but to test whether the associations (paths a, b, c′) among these variables were similar or different across diagnostic status, while adjusting for covariates.

We introduced covariates post hoc based on existing literature and significant demographic differences in our sample. Sex (Gershon, 2002; Tam et al., 2024), total number of siblings (Reimelt et al., 2021) and socioeconomic status (SES; Russell et al., 2016) were included due to group differences. Total anxiety/depression scores were included for their strong associations with main variables (Tam et al., 2024). Specifically, ADHD symptoms and childhood trauma scores were regressed on all four covariates; sex, internalizing symptoms (RCADS total score), SES (averaged parental education and household income), and number of children in the household; and dissociative-experience scores were regressed on sex and internalizing symptoms. Although each covariate is theoretically or empirically linked to at least one focal construct, its retention in the final analysis depended on preliminary tests confirming a significant bivariate correlation with the relevant outcome.

Statistical analyses were conducted using the lavaan package (version 0.6.15) in R (version 4.2.3). Models were estimated using the Maximum Likelihood (ML) estimator with bootstrap standard errors based on 1000 bootstrap draws to obtain robust inference for the indirect effects. Goodness-of-fit statistics were evaluated to assess model performance. A nonsignificant chi-square (χ^2) indicated good fit. The Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), which compare model fit to a baseline model, with values above 0.95, were indicative of excellent fit (Hu & Bentler, 1999). Furthermore, both the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR), with values below 0.08, confirmed adequate fit in accordance with established guidelines (Kaplan, 2008; Xia & Yang, 2019). Because this was a multi-group path model estimated simultaneously, CFI, TLI, RMSEA, and SRMR were interpreted as global fit indices for the overall model rather than separate per-group indices. Percentile bootstrapping was used for generating 95% confidence intervals. Furthermore, Monte Carlo simulations were used to generate 95% confidence intervals, offering robust and accurate estimates of indirect effects in complex models (Preacher & Selig, 2012).

Results

Preliminary analysis

Demographic differences

Descriptive statistics for the sample are provided in Table 1. There were no statistically significant differences between the ADHD group ($n = 54$) and the control group ($n = 54$) in terms of gender distribution, age, or maternal age. Fathers in the control group had higher educational attainment compared to the ADHD group ($p = .008$). Moreover, mothers in the ADHD group were more likely to be self-employed or not employed, whereas mothers in the control group were more often employed as teachers or in the private sector ($p < .001$). Similarly, a higher proportion of fathers in the control group worked in the private sector, while self-employment was more common among fathers of children in the ADHD group ($p = .002$). Household income levels also differed significantly between groups ($p = .002$), with families in the control group reporting higher income levels on average.

Group comparisons

Table 2 displays the mean scores and standard deviations for key variables in both groups. Youth in the ADHD group scored significantly higher than those in the control group across all subscales of the Conners Parent Rating Scale (CPRS-RS), including oppositional behaviors ($d =$

Table 1
Child and family characteristics.

	ADHD Group (N = 54)	Control Group (N = 54)	p
Gender (Male)	38 (70.4 %)	30 (55.6 %)	0.163
Age	14.4 (1.86)	14.5 (1.88)	0.614
Grade in School			
5	0 (0 %)	1 (1.9 %)	0.172
6	6 (11.1 %)	5 (9.3 %)	
7	5 (9.3 %)	10 (18.5 %)	
8	17 (31.5 %)	7 (13.0 %)	
9	5 (9.3 %)	10 (18.5 %)	
10	4 (7.4 %)	7 (13.0 %)	
11	5 (9.3 %)	6 (11.1 %)	
12	12 (22.2 %)	8 (14.8 %)	
Mother Age	44.3 (4.82)	43.8 (5.10)	0.643
Mother Education			
Primary School	0 (0 %)	1 (1.9 %)	0.104
Secondary School	18 (33.3 %)	8 (14.8 %)	
High School	15 (27.8 %)	16 (29.6 %)	
University	21 (38.9 %)	29 (53.7 %)	
Mother Occupation			
Housewife	27 (50.0 %)	28 (51.9 %)	<0.001
Self-employed	11 (20.4 %)	0 (0 %)	
Worker	2 (3.7 %)	1 (1.9 %)	
Civil Servant	3 (5.6 %)	2 (3.7 %)	
Teacher	0 (0 %)	10 (18.5 %)	
Doctor	3 (5.6 %)	0 (0 %)	
Nurse	2 (3.7 %)	0 (0 %)	
Retired	2 (3.7 %)	4 (7.4 %)	
Private Sector	4 (7.4 %)	9 (16.7 %)	
Father Age	47.0 (4.46)	47.9 (6.16)	0.384
Father Education			
Secondary School	13 (24.5 %)	3 (5.6 %)	0.008
High School	20 (37.7 %)	18 (33.3 %)	
University	20 (37.7 %)	33 (61.1 %)	
Father Occupation			
Self-employed	22 (41.5 %)	9 (16.7 %)	0.002
Worker	12 (22.6 %)	6 (11.1 %)	
Civil Servant	5 (9.4 %)	6 (11.1 %)	
Teacher	0 (0 %)	5 (9.3 %)	
Doctor	2 (3.8 %)	0 (0 %)	
Retired	1 (1.9 %)	2 (3.7 %)	
Private Sector	11 (20.8 %)	26 (48.1 %)	
Household Income Level			
Equal to Minimum Wage	12 (22.2 %)	3 (5.6 %)	0.002
Twice the Minimum Wage	27 (50.0 %)	20 (37.0 %)	
Above Twice the Minimum Wage	15 (27.8 %)	31 (57.4 %)	

Note. Continuous variables are presented as mean and standard deviation (M, SD); categorical variables are presented as counts and percentages (N, %); p-values were calculated using independent two-sample t-tests for continuous variables and chi-squared tests of independence for categorical variables.

1.41, $p < .001$), hyperactivity/impulsivity ($d = 1.75$, $p < .001$), inattention/cognition ($d = 3.83$, $p < .001$), and overall ADHD symptoms ($d = 3.31$, $p < .001$). Regarding dissociative symptoms (ADES), the ADHD group showed significantly higher scores on dissociative amnesia ($d = 0.71$, $p < .001$), absorption and imaginative involvement ($d = 0.88$, $p < .001$), passive influence ($d = 0.42$, $p = .032$), and total dissociation ($d = 0.64$, $p = .001$). No significant group differences were found for depersonalization/derealization, dissociative identity, or dissociated relatedness.

As for trauma exposure (CTQ), the ADHD group had higher scores for emotional abuse ($d = 0.60$, $p = .002$), emotional neglect ($d = 0.61$, $p = .002$), and total trauma ($d = 0.59$, $p = .002$), while no significant differences were observed for physical abuse, physical neglect, sexual abuse, or overprotection/overcontrol. Generalized anxiety scores (RCADS) were elevated in the ADHD group ($d = 0.39$, $p = .047$). However, total internalizing symptoms and other subscales (e.g., depression, panic disorder) did not show statistically significant differences.

Table 2
Comparison of the mean values of ADHD symptoms, dissociative symptoms, trauma scores and internalizing symptoms scores.

	ADHD Group	Control Group	Cohen's d	p
CPRS-RS - Oppositional	10.3 (5.70)	3.65 (3.49)	1.41	<0.001
CPRS-RS - Hyperactivity/ Impulsivity	7.26 (4.66)	1.11 (1.69)	1.75	<0.001
CPRS-RS - Inattention/ Cognition	9.93 (2.55)	1.44 (1.83)	3.83	<0.001
CPRS-RS - ADHD Index	23.2 (3.25)	5.93 (4.41)	4.46	<0.001
CPRS-RS Total	52.7 (13.6)	12.6 (10.4)	3.31	<0.001
ADES - Dissociative Amnesia	19.0 (11.8)	10.8 (11.1)	0.71	<0.001
ADES - Absorption and Imaginative Involvement	20.9 (11.5)	11.6 (9.24)	0.88	<0.001
ADES - Passive Influence	12.9 (10.2)	9.02 (8.30)	0.42	0.0318
ADES - Depersonalization / Derealization	22.2 (21.2)	17.2 (18.2)	0.25	0.196
ADES - Dissociated Identity	6.76 (8.28)	5.22 (6.16)	0.21	0.277
ADES - Dissociated Relatedness	7.35 (7.10)	5.52 (6.46)	0.27	0.163
ADES - Dissociation Total	74.9 (46.3)	46.9 (40.9)	0.64	0.001
CTQ - Emotional Abuse	7.83 (3.74)	6.15 (1.35)	0.60	0.002
CTQ - Physical Abuse	5.41 (1.17)	5.30 (0.92)	0.11	0.586
CTQ - Physical Neglect	13.3 (1.13)	13.0 (1.35)	0.28	0.146
CTQ - Emotional Neglect	9.81 (4.98)	7.43 (2.40)	0.61	0.002
CTQ - Sexual Abuse	5.26 (1.10)	5.22 (0.86)	0.04	0.846
CTQ - Overprotection - Overcontrol	8.39 (3.64)	7.48 (3.05)	0.27	0.163
CTQ Total	50.0 (11.8)	44.6 (5.68)	0.59	0.002
RCADS - Social Phobia	9.19 (6.24)	7.15 (5.64)	0.34	0.078
RCADS - Panic Disorder	5.04 (5.44)	3.72 (3.93)	0.28	0.153
RCADS - Major Depressive Disorder	7.39 (5.43)	6.61 (5.58)	0.14	0.465
RCADS - Separation Anxiety Disorder	2.89 (3.21)	2.83 (2.79)	0.02	0.924
RCADS - Generalized Anxiety	6.28 (4.12)	4.72 (3.93)	0.39	0.047
RCADS - Obsessive Compulsive Disorder	3.46 (3.93)	3.20 (2.78)	0.08	0.693
RCADS - Total Anxiety	26.9 (20.3)	21.6 (14.9)	0.29	0.131
RCADS - Total Internalizing Disorders	34.2 (24.7)	28.2 (19.3)	0.27	0.162

Note. Variables are presented as mean and standard deviation (M, SD); d represents Cohen's d, an estimate of effect size; p-values were calculated using independent two-sample t-tests.

Primary analysis

Model fit

In the multi-group path model, fit was mixed. The chi-square test was significant, $\chi^2(7) = 14.67$, $p = .040$. CFI was 0.94, indicating acceptable but not excellent fit (relative to the $\geq$ 0.95 criterion). TLI was 0.75, below conventional adequacy thresholds. RMSEA was 0.14 (90 % CI [0.03, 0.25]), exceeding recommended cutoffs, whereas SRMR was 0.056, within recommended limits. Robust (scaled) CFI and TLI were similar (0.94 and 0.75). Overall, the indices suggest partial fit adequacy with notable misfit, which may reflect modest per-group sample size and model complexity.

Group 1 (ADHD) parameter estimates

In the ADHD group, the path from trauma to dissociative experiences (a1 = 0.163, p = .153, 95 % CI [−0.067, 0.391]) did not reach statistical significance. The path from dissociative experiences to ADHD symptoms (b1 = 0.107, p = .230, 95 % CI [−0.066, 0.302]) was also nonsignificant (Fig. 1). The direct association of trauma with ADHD symptoms (c1 = 0.123, p = .162, 95 % CI [−0.035, 0.321]) was not significant. The indirect effect (a1 × b1) of 0.017 (p = .380) was not significant. The total effect of trauma on ADHD symptoms was 0.140 (p = .110), with approximately 12 % of that association linked to the dissociative experiences pathway (Effect Ratio = 0.124). Overall, dissociative experiences did not appear to account for a notable fraction of the variance shared between trauma and ADHD symptoms among youth with ADHD.

Group 2 (Control) parameter estimates

In the control group, the path from trauma to dissociative experiences (a2 = 0.529, p = .005, 95 % CI [0.130, 0.879]) was significant, indicating a strong association between higher levels of trauma and increased dissociative experiences (Fig. 1). Dissociative experiences were also significantly associated with ADHD symptoms (b2 = 0.292, p < .001, 95 % CI [0.173, 0.424]) above and beyond childhood trauma scores, highlighting a meaningful overlap between dissociative experiences and ADHD-like symptoms. In contrast, the direct association of trauma with ADHD symptoms (c2 = 0.095, p = .233, 95 % CI [−0.081, 0.237]) was not significant, but the indirect effect (a2 × b2) of 0.155 (p = .019, 95 % CI [0.035, 0.306]) indicated that a significant portion of the trauma–ADHD relation was shared with dissociation. The total effect was 0.250 (p = .004), and approximately 62 % of that association was linked through the dissociative experiences pathway (Effect Ratio = 0.618). Thus, for youth without ADHD, the indirect path from childhood trauma to ADHD-related symptoms via dissociative experiences was significant, whereas it was not significant in the ADHD group, indicating a statistically detectable group difference consistent with the hypothesized associational pathway pattern. Table 3 presents the standardized parameter estimates, p-values, and 95 % confidence intervals (CIs) based on 1000 bootstrap samples.

Regarding covariates, internalizing symptoms were significantly associated with higher dissociative experiences in both groups (ADHD: β=0.461, p<.001; control: β=0.547, p<.001). In the ADHD group, lower SES was associated with higher childhood trauma (β=−0.460, p=.027), and a greater number of children in the household was associated with higher parent-rated ADHD symptoms (β=0.264, p=.004). In the control group, sex was significantly associated with both ADHD symptoms (β=−0.200, p=.021) and dissociative experiences (β=−0.312, p=.032). Other covariate paths were not statistically significant. Importantly, inclusion of covariates did not alter the direction or significance pattern of the primary direct and indirect paths.

Between-Group comparison: differential pathways

A Wald test comparing groups showed that the indirect association

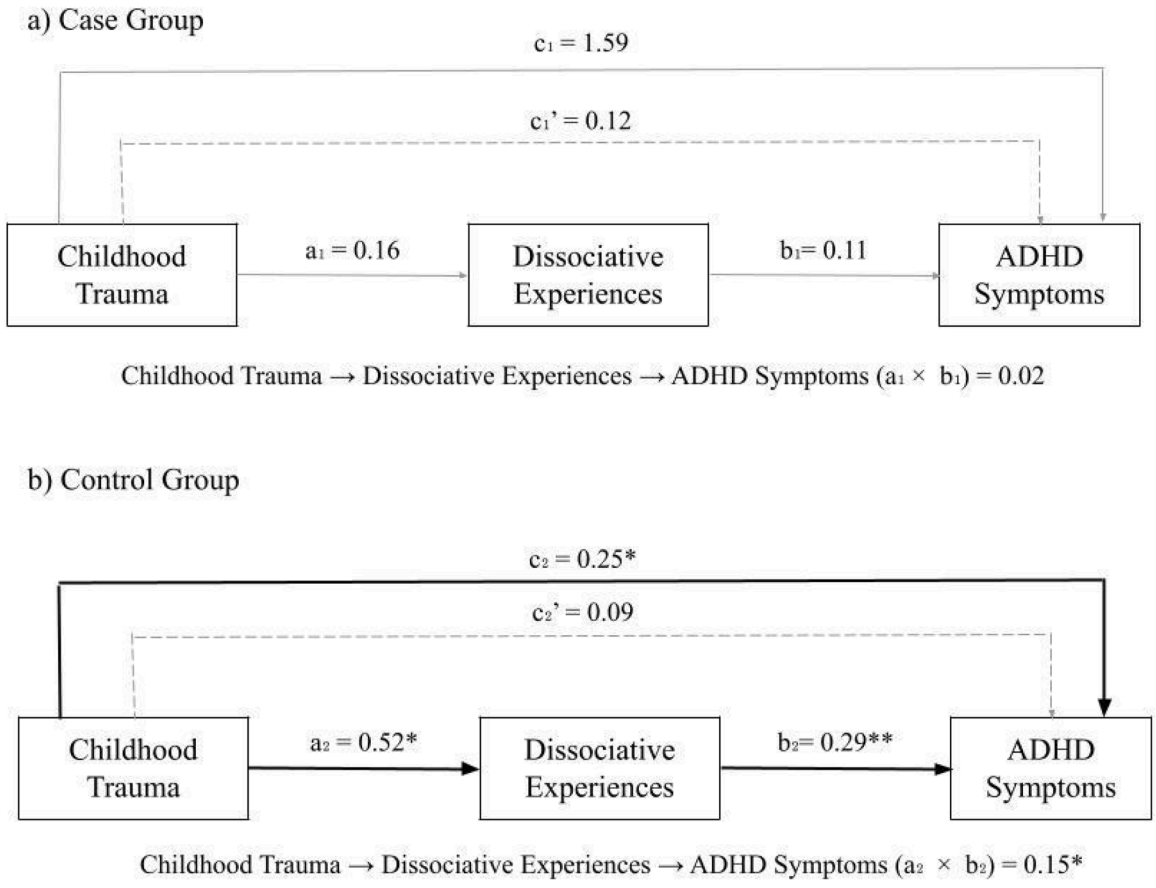

Fig. 1. The path model examining the association between childhood trauma, dissociative experiences and ADHD symptoms in case and control groups.

Table 3
Summary of path analysis.

Path	β	*p*	95 % CI
Group 1 (ADHD)			
Covariates			
ADHD Symptoms ~ Sex	−0.192	0.260	[−0.509, 0.156]
ADHD Symptoms ~ Internalizing Symptoms	0.014	0.878	[−0.202, 0.170]
ADHD Symptoms ~ SES	0.153	0.185	[−0.071, 0.377]
ADHD Symptoms ~ Number of Children at Home	0.264	0.004	[0.100, 0.468]
Childhood Trauma ~ Sex	0.433	0.204	[−0.259, 1.089]
Childhood Trauma ~ Internalizing Symptoms	0.432	0.008	[0.125, 0.803]
Childhood Trauma~ SES	−0.460	0.027	[−0.831, −0.004]
Childhood Trauma ~ Number of Children at Home	0.046	0.834	[−0.440, 0.459]
Dissociative Experiences ~ Sex	−0.149	0.399	[−0.469, 0.216]
Dissociative Experiences ~ Internalizing Symptoms	0.461	< .001	[0.224, 0.737]
Direct Paths			
Dissociative Experiences ~ Childhood Trauma (a1)	0.163	0.153	[−0.067, 0.391]
ADHD Symptoms ~ Dissociative Experiences (b1)	0.107	0.230	[−0.066, 0.302]
ADHD Symptoms ~ Childhood Trauma (c1′)	0.123	0.162	[−0.035, 0.321]
Indirect Path			
Childhood Trauma → Dissociative Experiences → ADHD Symptoms (a1 × b1)	0.017	0.380	[−0.022, 0.061]
Total (c1′ + a1 × b1)	0.140	0.110	[−0.015, 0.333]
Effect Ratio	0.124	0.945	[−0.261, 0.674]
Group 2 (Control)			
Covariates			
ADHD Symptoms ~ Sex	−0.200	0.021	[−0.376, −0.028]
ADHD Symptoms ~ Internalizing Symptoms	−0.008	0.896	[−0.138, 0.119]
ADHD Symptoms ~ SES	−0.153	0.066	[−0.322, 0.016]
ADHD Symptoms ~ Number of Children at Home	0.031	0.564	[−0.073, 0.139]
Childhood Trauma ~ Sex	−0.009	0.956	[−0.311, 0.329]
Childhood Trauma ~ Internalizing Symptoms	0.295	0.001	[0.142, 0.488]
Childhood Trauma ~ SES	−0.267	0.143	[−0.628, 0.094]
Childhood Trauma ~ Number of Children at Home	−0.084	0.337	[−0.261, 0.076]
Dissociative Experiences ~ Sex	−0.312	0.032	[−0.586, −0.012]
Dissociative Experiences ~ Internalizing Symptoms	0.547	< .001	[0.284, 0.836]
Direct Paths			
Dissociative Experiences ~ Childhood Trauma (a2)	0.529	0.005	[0.130, 0.879]
ADHD Symptoms ~ Dissociative Experiences (b2)	0.292	< .001	[0.173, 0.424]
ADHD Symptoms ~ Childhood Trauma (c2′)	0.095	0.233	[−0.081, 0.237]
Indirect Path			
Childhood Trauma → Dissociative Experiences → ADHD Symptoms (a2 × b2)	0.155	0.019	[0.035, 0.306]
Total (c2′ + a2 × b2)	0.250	0.004	[0.059, 0.405]
Effect Ratio	0.618	0.977	[0.153, 1.604]

Note. β values are standardized regression coefficients; 95 % confidence intervals come directly from the bootstrap-based percentile method. β; "~" indicates a regression path (is regressed on); "→" denotes the direction of the path; a, b, c′, c represents specific path labels; ADHD = Attention Deficit Hyperactivity Disorder; Effect Ratio indicates the proportion of the total effect that is mediated (indirect effect divided by total effect).

differed significantly between adolescents with ADHD and controls, $\chi^2(1) = 4.54$, $p = .033$, indicating that the indirect path from childhood trauma to ADHD symptoms via dissociative experiences was statistically significant in the control group but not in the ADHD group. It suggests that trauma-related variability in ADHD-like symptoms is more consistently carried through dissociative experiences among controls than among adolescents with ADHD.

A 10,000-replication Monte Carlo simulation (percentile 95 % CIs) confirmed the group-specific pathway pattern. In the ADHD group the indirect effect was small and non-significant (β = 0.017, 95 % CI [−0.021, 0.056]), and the total effect likewise included zero (β = 0.140, 95 % CI [−0.036, 0.311]). In contrast, the control group showed a significant indirect effect (β = 0.155, 95 % CI [0.045, 0.291]) and a significant total effect (β = 0.250, 95 % CI [0.085, 0.426]).

Discussion

In this cross-sectional multi-group path analysis of youth with clinician-confirmed ADHD and typically developing controls, the pattern of associations among childhood trauma, dissociative experiences, and ADHD symptoms differed by diagnostic status. In controls, higher childhood trauma scores were associated with higher dissociative experiences, and dissociative experiences were associated with higher parent-rated ADHD-like symptoms; the indirect pathway was statistically significant. In youth with ADHD, neither component path was significant, and the indirect pathway was not supported. These findings indicate group differences in associational pathways rather than evidence of developmental causation.

These group-specific findings are consistent with two partially competing conceptual accounts of attentional problems in trauma-exposed youth. A trauma-informed account proposes that dissociative processes (eg, absorption, discontinuities in memory/awareness, state-dependent attentional narrowing) may produce ADHD-like behavioral phenotypes without implying diagnostic equivalence (Ford, 2018; Nijenhuis, 2015, 2017; Putnam, 1997; Szymanski et al., 2011). A neurodevelopmental account proposes that ADHD symptoms primarily reflect trait-like liability, with adversity contributing to burden and comorbidity but less to core attentional mechanisms (Faraone & Larsson, 2018; Faraone et al., 2015). Our results align with this contrast: in controls, dissociation captured a substantial proportion of the trauma-related variance in ADHD-like symptoms; in the ADHD group, this pathway was not supported.

The significant indirect effect in controls (β≈0.16) indicates a small-to-moderate association that is clinically interpretable in differential assessment contexts. It is not large enough to suggest that dissociation is the sole pathway from trauma to attentional complaints, but it is sufficient to justify routine consideration of trauma-related dissociative processes when ADHD-like symptoms are reported in youth without a confirmed ADHD diagnosis.

Dissociation was not globally elevated across all domains. Group differences were most evident for dissociative amnesia, absorption/imaginative involvement, and passive influence, whereas depersonalization/derealization and identity-related dimensions did not differ significantly. This pattern suggests a partial dissociative profile in ADHD-referred adolescents, more closely tied to attentional and mnemonic fluctuations than to pervasive alterations in identity or reality-experience (Esposito et al., 2025). Phenomenologically, such selective elevations can resemble inattentiveness, variable task engagement, and forgetfulness, potentially increasing diagnostic ambiguity in trauma-exposed presentations (Soffer-Dudek & Somer, 2023; Vancappel et al., 2021). This interpretation is consistent with the findings of Philippine et al. (2026) that trauma-focused cognitive behavioral therapy

reliably reduces internalizing and dissociative symptoms, whereas effects on core ADHD symptoms remain limited.

No evidence for an indirect trauma-dissociation-ADHD pathway was found in youth with ADHD. A cautious interpretation is that this pattern is compatible with a more neurodevelopmental, trait-like ADHD phenotype in which dissociation reflects a transdiagnostic dimension rather than a core mechanistic pathway (García-Morales, 2024; Lyssenko et al., 2017). This interpretation may be further supported by the very high ADHD symptom burden in the case group (Table 2), which may compress variance and reduce detectable incremental associations.

Covariate findings also contextualize the main pathway results. Internalizing symptoms were positively associated with dissociative experiences in both groups, consistent with transdiagnostic overlap between distress and dissociative phenomena (Černis et al., 2020). In the ADHD group, lower SES was associated with higher trauma scores, and a greater number of children in the household was associated with higher ADHD symptom scores. In controls, sex was associated with both dissociative experiences and ADHD-like symptoms. These covariate patterns did not materially change the between-group contrast in the indirect pathway.

From a clinical standpoint, the findings support trauma-informed differential formulation rather than diagnostic substitution. Dissociation screening (eg, A-DES) may be most informative when attentional complaints occur without an established ADHD diagnosis. In that context, elevated dissociation may indicate trauma-linked attentional dysregulation and guide trauma-focused assessment/intervention planning. Conversely, in already diagnosed ADHD, dissociation screening may still be clinically relevant for comorbidity characterization, but in this dataset it did not explain substantial additional variance in ADHD symptom severity.

Strengths and limitations

Several methodological features bolster the rigor of the present investigation into childhood trauma, dissociative experiences, and ADHD-related symptoms. First, we proactively modelled potential confounders, sex, internalizing symptoms, socioeconomic status (indexed by parental education and household income), and number of children in the home, thereby isolating the focal pathways of interest. Second, by adopting a multi-group path analysis framework we could probe both direct and indirect effects simultaneously and test whether these pathways differed between clinically diagnosed ADHD youth and their typically developing peers. Third, bootstrapped standard errors (1000) combined with 10,000-draw Monte Carlo confidence intervals enhanced the precision and stability of indirect-effect estimates, yielding robust inferences despite modest sample sizes. Finally, we presented the model in multi-group form to prioritize clinical interpretability (ie, transparent group-specific a and b pathways) rather than a single interaction-term parameterization.

There are several limitations. In our sample, control symptoms were low on average. This pattern is expected in non-referred community samples, where base rates of clinically meaningful ADHD-like behaviors and dissociation are low. When instruments operate primarily in their lower range, score variability is compressed, statistical power drops, and the probability of Type II error (missing real effects) rises, even when measurement reliability is adequate. Thus, the present estimates are likely biased toward the null, and the most cautious interpretation is that our effects, especially the indirect pathways, are underestimates rather than false positives. Our aims were dimensional and mechanistic in a non-referred sample; we do not claim to have identified an at-risk clinical subgroup, and establishing clinical utility will require targeted studies that oversample symptomatic controls and apply validated clinical thresholds. Findings elucidate mechanistic links in community samples rather than providing immediate screening guidance for clinical triage. Moreover, we did not model CTQ, A-DES, or Conners subscales simultaneously; thus we cannot determine whether specific dissociative or ADHD dimensions account for a larger share of trauma-related variance.

Maxwell and colleagues (2011) caution that cross-sectional mediation analyses cannot establish temporal precedence among variables or elevate statistical associations to causal claims. These caveats apply to the current investigation, which posits that childhood trauma sets the stage for ADHD-like symptoms through its impact on dissociative experiences. Although this ordering is theoretically grounded, childhood maltreatment is, by definition, temporally antecedent and has been repeatedly tied to later dissociative symptoms (Brand & Frewen, 2017; Vonderlin et al., 2018), our single-time-point design cannot rule out alternative sequences or reciprocal influences. Likewise, extant evidence that dissociation can mimic attentional lapses (Soffer-Dudek & Somer, 2023) and that trauma exposure influences ADHD symptomatology (Rubright et al., 2024) bolsters the plausibility of our model but does not prove causation. Consequently, the observed indirect effect should be interpreted as a statistical partitioning of shared variance rather than definitive evidence that trauma-induced dissociation causes attentional difficulties. Longitudinal, experimental, or intensive-sampling studies are required to clarify whether dissociative processes mediate a developmental cascade from early trauma to ADHD-like behavior, whether the association is bidirectional, or whether unmeasured factors account for the associations observed here.

Because this was a feasibility-based single-centre study, we did not perform a formal a priori power calculation. Using Fritz and MacKinnon's (2007) benchmarks as a post hoc guide, the sample size required for ~80 % power in bootstrap mediation depends on the magnitudes of both component paths. For path combinations in the large-medium range, the required sample is about 59, which is most consistent with the effect-size pattern in our ADHD (case) group. In the control group, where the observed path combination differed ($a_2 = 0.52$, $b_2 = 0.29$), the required N for comparable power may be higher (often in a moderate range, e.g., approximately 78–124 depending on assumptions). With 54 participants per group, the study was likely underpowered for subtle indirect effects; therefore, findings, particularly subgroup-specific indirect effects, should be interpreted cautiously and replicated in larger samples.

Another key limitation is measurement method and informant structure. Childhood trauma and dissociative experiences were assessed by adolescent self-report (CTQ, A-DES), whereas ADHD symptom severity was assessed by parent report (CPRS-RS). This multi-informant structure reduces some same-source inflation but still introduces recall, perception, and social-desirability biases, and teacher ratings were used for diagnostic support rather than included analytically. In addition, objective/performance-based attention measures were not available. Future work should use multi-method, multi-informant designs (including teacher-report and performance-based indicators) to strengthen construct validity and reduce reporting bias. Moreover, recruiting participants from a clinical setting may limit the generalizability of the findings, as the sample may not reflect the characteristics of the broader adolescent population. Future research involving more diverse and representative samples would help strengthen the robustness and applicability of these results.

Conclusion

In youth, trauma-related dissociative experiences appear to account for part of the association between childhood trauma and ADHD symptoms in those without diagnosed ADHD, but not in those with clinician-confirmed ADHD. These findings support a trauma-informed differential assessment of attentional complaints and caution against assuming diagnostic equivalence between dissociative attentional disturbance and neurodevelopmental ADHD. Given the cross-sectional, feasibility-based design, results should be interpreted as associational and replicated in larger, prospectively powered multicentre studies.

Statements and declarations

Ethical considerations

This study was approved by The Bezmialem Vakif University Faculty of Medicine's Institutional Review Board (IRB No: E-35,700,536-108.99–151,880).

Consent to participate

All adolescent participants and their parents (legal guardians) provided informed consent to participate in the study. Participation was voluntary, and all procedures were conducted in accordance with relevant ethical guidelines and regulations.

Consent for publication

All authors provided consent for publication.

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The data that support the findings of this study are available on request from the corresponding author. The current study was not preregistered.

CRediT authorship contribution statement

Songül Derin: Writing – review & editing, Supervision, Resources, Project administration, Investigation, Conceptualization. **Ahmet Faruk Ergun:** Writing – review & editing, Writing – original draft, Software, Resources, Methodology, Investigation, Formal analysis, Conceptualization. **Saliha B. Selman:** Writing – review & editing, Writing – original draft, Visualization, Software, Resources, Methodology, Formal analysis, Conceptualization. **Medaim Yanik:** Writing – review & editing, Supervision, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this manuscript.

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