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ORIGINAL ARTICLE

Medicine Science International Medical Journal

Medicine Science 2025;14(2):502-8

Adverse childhood experiences, self-compassion, and self-harming behavior in adolescents with substance use disorders

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Received 14 February 2025; Accepted 11 March 2025
Available online 31 May 2025 with doi: 10.5455/medscience.2025.02.048

Abstract

The aim of this study was to investigate the relationship between adverse childhood experiences, self-compassion, and self-harming behavior in adolescents diagnosed with substance use disorder. The study included 63 adolescents from Türkiye who had been diagnosed with a substance use disorder. To assess the predictive effects of childhood adversity and self-compassion on self-harming behavior, multiple hierarchical regression analyses were conducted. The participants had a mean age of 15.57±1.32, and 52.4% (n=33) were male. The findings revealed that demographic factors, such as age and gender, did not significantly predict self-harming behavior. However, when adverse childhood experiences were added to the model, emotional abuse and neglect emerged as significant positive predictors of self-harm. In the final step, self-compassion was incorporated into the model, and the overall predictors accounted for approximately 18% of the variance in self-harming behavior. This additional change in R^2 was significant, with emotional abuse, neglect, and self-compassion all serving as significant predictors of self-harming behavior. These findings suggest that emotional abuse, neglect, and self-compassion play a crucial role in self-harming behavior among adolescents with substance use disorder. In this context, self-compassion-based interventions may be beneficial in reducing self-harming behavior following adverse childhood experiences.

Keywords: Adverse childhood experiences, self-compassion, self-harming behavior, substance use disorder, adolescence

Introduction

The prevalence of substance use disorders (SUD) has become a significant problem worldwide. It is known that alcohol or substance trying is common during adolescence, and a large majority of adults diagnosed with SUD have started using alcohol or substances during their adolescence [1]. Early onset of substance use poses a higher risk for lifelong mental and physical illnesses, leading to academic failure and subsequently economic problems [2,3]. Non-suicidal self-harming (NSSH) and suicide also rank among the most important health issues in adolescents. It has been shown that NSSH behavior can reach up to 66% in adolescents [4].

NSSH behaviors can be defined as engaging in deliberate acts of self-harm without the intention of suicide. Some of these behaviors include cutting, scratching, biting, burning, pulling out hair, ingesting harmful substances, and hitting oneself [5]. NSSH behaviors are often used to cope with internal struggles such as emotional distress, stress, depression, or trauma [6]. Particularly during adolescence, various factors such as identity exploration, family conflicts, difficulties in peer relationships, and traumatic experiences during childhood can contribute to the emergence of self-harming behaviors [4]. Given the repetitive nature of these behaviors, the problems they create in the short and long term, and their potential to trigger suicidal behaviors, it is crucial to focus on NSSH behaviors during adolescence and to investigate the underlying reasons for these behaviors [5]. Additionally, evidence suggests a strong association between alcohol and substance use and NSSH [7].

CITATION
Kurtoglu MB, Sezer Katar K, Zengin Ispir G, et al. Adverse childhood experiences, self-compassion, and self-harming behavior in adolescents with substance use disorders. Med Science. 2025;14(2):502-8.

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DOI: 10.5455/medscience.2025.02.048

Negative experiences such as childhood traumas, physical neglect and abuse, emotional neglect and abuse, and sexual abuse can adversely affect an individual's psychosocial development. These types of traumas often lead children to experience emotional distress, low self-esteem, and post-traumatic stress disorder, among other problems [8]. Consequently, such experiences can trigger the development of risky behaviors in later stages, such as substance use disorders and self-harming behaviors [9]. Similarly, childhood trauma can lead individuals to resort to self-harm as a way of coping with or escaping distressing experiences [10].

Self-compassion refers to the understanding, acceptance, and kindness that individuals extend toward themselves. It can facilitate coping with stress and help individuals deal with negative emotions in a healthier manner [11]. Research indicates that having sufficient levels of self-compassion may serve as a protective factor against substance use [12]. Similarly, a lack of self-compassion can be associated with self-harming behaviors [13]. Therefore, self-compassion can have a positive impact on substance use and also serve as a protective factor against self-harming behaviors [14]. Childhood traumas can lead individuals to develop negative beliefs about themselves and develop a critical inner voice, causing them to blame themselves rather than heal their emotional wounds. This process can negatively impact self-compassion. Conversely, those who cultivate self-compassion are better equipped to handle the negative effects of childhood trauma and establish a more resilient and healthy foundation for coping with these experiences [15].

Despite the extensive research on adverse childhood experiences (ACEs), self-compassion, and NSSH, there remains a notable gap in the literature regarding their joint interaction, particularly in adolescents diagnosed with substance use disorders [16,17]. While the individual roles of childhood trauma and self-compassion have been explored in relation to self-harm or substance use [18,19], few studies have adopted a comprehensive model that simultaneously considers these variables in adolescent populations with SUD. Moreover, the protective function of self-compassion against both substance misuse and self-injurious behaviors has been underrepresented, especially within high-risk groups such as traumatized youth with comorbid conditions [20]. Addressing this gap is critical for developing more integrated and trauma-informed intervention strategies that consider not only pathological risk factors but also psychological resilience variables like self-compassion [21].

This study aims to examine the impact of self-compassion and childhood traumas on self-harming behaviors in adolescents with substance use disorders and contribute to the limited data in this field. The hypotheses of our study are as follows: childhood traumas have a positive effect on self-harming behaviors in adolescents with substance use disorders, while self-compassion has a negative effect.

Material and Methods

Study Sample and Procedure

Using the G*Power software, a sample size calculation was conducted for a multiple linear regression analysis involving three independent variables. Based on an effect size of $f^2=0.22$, a significance level of $\alpha=0.05$, and a statistical power of $(1-\beta)=0.80$, the analysis indicated that the minimum required sample size is 54 participants. The study was conducted at a specialized adolescent substance use disorder rehabilitation center that provides both inpatient and outpatient treatment services. A total of sixty-three adolescents who met the inclusion criteria were recruited from individuals receiving care at this facility. These adolescents were not actively using substances at the time of participation and were undergoing rehabilitation follow-up. Inclusion criteria for the study were: (1) a diagnosis of Substance Use Disorder (SUD) based on DSM-5 diagnostic criteria, (2) a history of Non-Suicidal Self-Harm (NSSH), (3) current participation in inpatient or outpatient treatment at the rehabilitation center, and (4) voluntary consent to participate. Exclusion criteria included illiteracy, unwillingness to participate, and ongoing substance use. SUD diagnoses were made by experienced psychiatrists at the center, using structured clinical interviews in accordance with DSM-5 criteria. In contrast, while NSSH is not a distinct diagnostic category in DSM-5, participants were identified as having a history of NSSH based on both clinical interviews and self-report assessments. Specifically, the presence of NSSH was confirmed using the Inventory of Statements About Self-Injury as well as through evaluations conducted by clinicians during psychiatric intake assessments. These procedures ensured a consistent and comprehensive approach to case identification. The participants' sociodemographic information is presented in Table 1.

Table 1. Sociodemographic variables of the participants

Variable		Frequency	Ratio (%)
Gender	Female	30	47.6
	Male	33	52.4
	Total	63	100
Economic status	Low	37	58.7
	Middle	24	38.1
	High	2	3.2
	Total	63	100
Educational status	Primary school	36	57.14
	Secondary school	24	38.09
	High school	3	4.77
	Total	63	100
	Minimum	Maximum	Mean±SD
Age	12	18	15.57±1.32

SD: Standard Deviation.

DOI: 10.5455/medscience.2025.02.048

Data Collecting Tools

Sociodemographic data form: Using this researcher-designed form, data on participants' age, gender, self-reported income levels, and educational status were collected.

Inventory of Statements About Self-Injury: Developed by Klonsky and Glenn, the Inventory of Statements About Self-Injury (ISAS) consists of two separate sections. The first section examines how often individuals engage in 12 distinct self-harming behaviors intentionally and without suicidal intent. These behaviors include cutting, biting, burning, carving letters/writing/figures into the skin, pinching, pulling hair, scratching, hitting oneself, interfering with wound healing, rubbing the skin against a rough surface, self-piercing with needles, and consuming/drinking harmful substances [22]. Participants report the number of times they have engaged in each behavior. In addition, five multiple-choice questions explore various descriptive and structural aspects of these behaviors, including the age of first self-harm, pain perception during the act, whether the behavior occurs alone or with others, the time lapse between the urge and the action, and the desire to cease self-harming. Those who endorse at least one self-harm behavior in the first section proceed to complete the second section of the scale. The second section explores the various functions of self-harm behaviors with 39 items. Answers were: “0 - No; 1- Yes, once; 2- Yes, more than once”. 0-78 points could be taken from this inventory. In the original version of the scale, the total Cronbach’s alpha coefficient ranged between 0.80 and 0.89, with 0.84 for the first section and 0.81 for the second section. The inventory was adapted to Turkish culture through a study conducted on high school students in 2008 [22,23]. In the Turkish adaptation study of the scale, the Cronbach’s alpha values were reported as 0.92 for the total score, 0.90 for the first section, and 0.87 for the second section.

The Childhood Trauma Questionnaire-Short Form (CTQ-SF): Originally known as the childhood trauma questionnaire, is a valid and reliable quantitative measurement tool that retrospectively assesses experiences of abuse and neglect before the age of 20. Developed by Bernstein and colleagues, the CTQ-SF is based on self-reporting and is easy to administer.

Initially comprising 53 items, the scale now consists of 28 items, 1 point to 5 points Likert-type questions. The CTQ-SF was adapted into Turkish in 2012. The questionnaire's subscales assess childhood experiences of physical, sexual, and emotional abuse, along with emotional and physical neglect. The total score is calculated by summing the scores from five subscales: sexual, physical, and emotional abuse, as well as physical neglect. Higher scores indicate greater exposure to childhood trauma. Specifically, items 3, 8, 14, 18, and 25 assess emotional abuse, items 5, 7, 13, 19, and 28 assess emotional neglect, items 9, 11, 12, 15, and 17 assess physical abuse, items 1, 4, 6, 2, and 26 assess physical neglect, and items 20, 21, 23, 24, and 27 assess sexual abuse. Additionally, items 10, 16, and 22 assess trauma denial. Before scoring the CTQ, scores for positively phrased items (2, 5, 7, 13, 19, 26, 28) are reversed. Subscale scores range from 5 to 25, while the total score ranges from 25 to 125 [24,25].

The Childhood Trauma Questionnaire (CTQ) includes empirically derived cut-off scores that allow for categorization of trauma severity across its five subscales. According to Bernstein et al. (2003), responses can be classified into four levels: none to low, low to moderate, moderate to severe, and severe to extreme. Specifically, for Emotional Abuse, scores of ≤12 indicate none to low, and ≥13 suggest moderate to severe trauma. For Physical Abuse, ≤7 is none to low, while ≥10 denotes moderate to severe. For Sexual Abuse, a score of ≤7 indicates none to low, and ≥8 reflects moderate to severe abuse. Emotional Neglect scores ≤14 are categorized as none to low, whereas ≥15 suggest moderate to severe neglect. Lastly, for Physical Neglect, scores of ≤9 indicate none to low, and ≥10 signify moderate to severe trauma. These thresholds are widely used to interpret individual trauma experiences in both clinical and research contexts.

The Childhood Trauma Questionnaire–Short Form (CTQ-SF) demonstrated strong internal consistency with Cronbach’s alpha coefficients of 0.88 for the total scale, 0.85 for Emotional Neglect, 0.87 for Emotional Abuse, 0.81 for Physical Abuse, 0.93 for Sexual Abuse, and a relatively lower value of 0.61 for Physical Neglect. The Turkish adaptation of the CTQ demonstrated excellent internal consistency with Cronbach’s alpha coefficients of 0.93 for the total scale, and 0.88 for Emotional Abuse, 0.79 for Physical Abuse, 0.89 for Sexual Abuse, 0.85 for Emotional Neglect, and 0.61 for Physical Neglect.

The Self-Compassion Scale-Short Form (SCS-SF): The Self-Compassion Scale, originally developed by Neff (2003), was later shortened by Raes, Pommier, Neff, and Van Gucht (2011) to create its short form. The scale was adapted to Turkish culture in 2018. The Short Form of the Self-Compassion Scale (SCS-SF) is a unidimensional measure that accounts for 44.87% of the total variance. While the original SCS is a multidimensional scale with six distinct components, the SCS-SF is commonly treated as one-dimensional for practical and psychometric reasons; however, theoretical support for the six-factor structure remains. The Self-Compassion Scale – Short Form (SCS-SF) demonstrated adequate internal consistency, with Cronbach’s alpha coefficients ≥ 0.86 across multiple samples, as reported by Raes and colleagues [26]. The Turkish adaptation of the Self-Compassion Scale–Short Form by Yıldırım and Sarı (2018) showed acceptable internal consistency, with a Cronbach’s alpha coefficient of 0.75, based on a revised 11-item, single-factor model.

Comprising 11 items, the scale employs a 5-point Likert format, ranging from "Never (1)" to "Always (5)." Total scores vary between 11 and 55, with higher scores reflecting greater levels of self-compassion. Additionally, items 1, 4, 8, 9, 10, and 11 are reverse-scored. [26-28]. Although Neff and colleagues have not established strict clinical cut-off scores for the Self-Compassion Scale – Short Form (SCS-SF), several studies have proposed interpretative guidelines based on score ranges. Specifically, Neff (2003, 2023) and others suggest that average item scores between 1.0 and 2.4 may be interpreted as low self-compassion,

DOI: 10.5455/medscience.2025.02.048

scores from 2.5 to 3.4 as moderate self-compassion, and scores ranging from 3.5 to 5.0 as high self-compassion [27]. These classifications are derived from the mean of Likert-type item responses rated on a 1-to-5 scale. It is important to note that these values serve descriptive purposes and should not be considered diagnostic thresholds; thus, their use in clinical settings should be approached with caution.

Ethical Considerations

The study received ethical approval from the Hasan Kalyoncu University Ethics Committee (Date: 22.11.2023 – Number: E-97105791-050.01.01-46627) and was conducted in accordance with the principles of the Helsinki Declaration.

Analytic Approach

Before testing the main hypotheses, preliminary analyses were conducted, including data screening and cleaning, examination of descriptive statistics, determination of associations between study variables, and normality assumption through skewness and kurtosis scores (<|1|). Following that, a multiple hierarchical regression analysis was performed to explore the predictive effect of childhood adverse experiences and self-compassion on self-harming behavior in adolescents with substance use disorder. In the first stage, demographic variables (i.e., age and gender) were independent variables and self-harming behavior was the dependent variable. In the second stage, childhood adverse empierces (i.e., pyhsical abuse, sexual abuse, and emotional abuse) were added to the model. In the last stage, self-compassion variable is added to the model. This order reflects the the expected importance of the independent variables in predicting the outcome. Before conducting multiple hierarchical regression analyses, the prerequisites for running regression analysis were assessed. Initially, checks were conducted for multicollinearity among the independent variables using measures such as Tolerance, correlations, and VIF, all of which fell within acceptable thresholds [29]. Furthermore, assessments of scatterplots and residuals confirmed adherence to the assumptions of linearity and homoscedasticity. Evaluation of the normality of the study variables was based on skewness and kurtosis values as mentioned previously. Following the assumption testing, separate hierarchical regression analyses were performed for the dependent variable of self-harming behavior. All analytical process was carried out by using the SPSS v24 (Statistics Package for Social Sciences).

Results

Preliminary Analyses

Descriptive statistics revealed that skewness and kurtosis scores of the study variables ranged between -.75 and 1.02, which suggested that they were all relatively normally distributed [29], as seen in Table 2.

Table 2. Participants scales' scores

	Mean	SD	Skewness	Kurtosis
CTQ-SF Physical abuse and neglect	24.27	3.37	-.684	-.079
CTQ-SF Sexual abuse	9.52	2.61	.471	-.382
CTQ-SF Emotional abuse and neglect	19.40	3.51	-.185	.444
SCS-SF	32.94	5.02	-.753	1.021
ISAS	44.87	13.31	-.081	-.532

CTQ-SF: Childhood Trauma Questionnaire-Short Form, SCS-SF: Self-Compassion Scale-Short Form, ISAS: Inventory of Statements About Self-Injury, SD: standard deviation

Moving to correlational results, physical abuse and neglect were positively correlated with emotional abuse and neglect. It had no significant relationship with physical abuse and neglect and self-compassion and self-harming behavior. Regarding sexual abuse, it was similarly associated with emotional abuse and neglect, but not significantly associated with the remaining variables. Moreover, emotional abuse and neglect had a significant association with self-harming behavior. Finally, self-compassion was negatively related to self-harming behavior. However, no significant relationships were observed for other variables in the study. All correlations are presented in Table 3.

Table 3. Correlation between CTQ-SF subscores, SCS-SF, and ISAS scores

	1	2	3	4	5
1. Physical abuse and neglect	—				
2. Sexual abuse	.15	—			
3. Emotional abuse and neglect	.45**	.44**	—		
4. Self-compassion	-.01	.17	-.06	—	
5. Self-harming behavior	.08	.05	.28*	-.42**	—

CTQ-SF: Childhood Trauma Questionnaire-Short Form, SCS-SF: Self-Compassion Scale-Short Form, ISAS: Inventory of Statements About Self-Injury, *p<.05; **p<.001, SD: standard deviation

DOI: 10.5455/medscience.2025.02.048

Hierarchical Regression Analyses

In the first stage, demographic variables (i.e., age and gender) did not significantly contribute to the model, which accounted for nearly 0% variance in self-harming behavior. In the second stage, childhood adverse experiences were included in the model, but they also did not significantly contribute to the model, explaining a 1% variance in self-harming behavior. In the last step, self-compassion was entered into the model, and the whole predictors together explained nearly 18% of the variance in self-harming behavior. This additional change in R^2 was significant, and emotional abuse and neglect (B=1.15, p<.05) and self-compassion (B=-1.22, p<.001) significantly predicted self-harming behavior, as displayed in Table 4. Emotional abuse and neglect were significant positive predictors of self-harming behavior, while self-compassion more strongly negatively predicted this variable.

Table 4. Hierarchical regression analysis for self-harming behavior

	Model 1			Model 2			Model 3		
Model	**B**	**SE**	**β**	**B**	**SE**	**β**	**B**	**SE**	**β**
(Constant)	46.81	7.94		35.64	16.05		82.72	19.10	
Age	-2.02	3.43	-.08	-2.25	3.43	-.08	-4.07	3.12	-.15
Gender	.79	3.414	.03	-.93	3.63	-.03	-4.22	3.38	-.16
Physical abuse and neglect				-.28	.567	-.07	-.19	.51	-.05
Sexual abuse				-.57	.774	-.11	-.27	.70	-.05
Emotional abuse and neglect				1.36	.60	.36*	1.15	.55	.31*
Self-compassion							-1.22	.32	-.46**
R^2 change		.007			.086			.184	
F for R^2 change		.21, p=.81			1.79, p=.16			14.23, p<.001	

B: unstandardized coefficients, SE: standard error, β: standardized coefficients, R^2: coefficient of determination

Discussion

Our study revealed a positive correlation between emotional neglect, emotional abuse, sexual abuse, and both physical neglect and abuse among adolescents with substance use disorders. Furthermore, self-harming behavior was found to be positively associated with emotional neglect and abuse while showing a negative correlation with self-compassion. Hierarchical regression analyses conducted to determine predictors of self-harming behavior revealed that self-compassion reduced self-harming behaviors, whereas emotional neglect and abuse increased them.

In line with our first hypothesis, we found that emotional abuse and neglect were predictors of NSSH in adolescents with substance use disorder. Similarly, previous studies have indicated that emotional neglect contributes to an increased likelihood of NSSH in Chinese young adults with major depression [30], and any type of childhood abuse was significantly related to NSSH [31]. Our results go beyond previous reports, showing that NSSH was associated with emotional abuse, but not associated with sexual or physical abuse in undergraduate adolescents [32]. Patients with SUD experienced higher levels of childhood trauma compared to those without SUD [10,33], and this makes researching childhood traumas in adolescents with substance use disorder important for NSSH as well.

Experiencing emotional abuse and neglect during childhood leading to NSSH is not surprising. Emotionally abused and neglected children tend to be more self-critical and judgmental towards themselves [15]. Additionally, a child whose emotional needs have not been met adequately may struggle in recognizing and managing their emotions. This can result in difficulties in adolescence and adulthood, where individuals may resort to self-harm as they cannot effectively regulate negative emotions [34].

Our second hypothesis was also supported, indicating that self-compassion was inversely related to NSSH. This finding aligns with previous research, as a meta-analysis demonstrated that self-compassion had a negative association with both NSSH and suicidal thoughts and behaviors [35] and another study showed that self-compassion had a moderator effect on the association between NSSH and depression in adolescents [13]. It is by now generally accepted that having high levels of self-compassion is protective across various psychiatric conditions [36,37]. Individuals who are more compassionate and understanding towards themselves tend to judge themselves less and exhibit less self-critical behavior when faced with challenges. Individuals with low self-compassion, on the other hand, are more likely to blame and punish themselves when facing negative emotions, which may lead to NSSH [35,38]. It is not surprising that substance use disorders, which can be considered a form of self-punishment, are more prevalent among individuals with lower levels of self-compassion [12].

In our study, finding a positive correlation between emotional neglect and abuse with sexual abuse, and between physical abuse and neglect, is consistent with the literature [39]. Parents who neglect or abuse their children in any way may have also abused them in different ways [40]. Unexpectedly, our study did not reveal a correlation between NSSH and sexual abuse, physical

DOI: 10.5455/medscience.2025.02.048

abuse, or neglect. This could be due to participants developing different coping mechanisms for handling sexual abuse, physical neglect, and physical abuse compared to emotional abuse and neglect.

While this study reinforces the link between NSSH, self-compassion, and emotional abuse and neglect, it is important to acknowledge several potential limitations. First of all, retrospective self-reported information could be a potential limitation due to biased recall or forgetting. Secondly, our participants were adolescents which may limit its generalizability to younger populations or adults. Our study sample was recruited from an adolescent substance use disorder rehabilitation center, so our findings did not represent the adolescents who did not get rehabilitation services, or adolescents who actively use substances. Finally, the type of used substances or the treatment details of the participants were not included, which might affect the scales' scores.

Conclusion

To sum up, this study underscores the significant impact of emotional neglect and abuse on non-suicidal self-harming (NSSH) behaviors among adolescents with substance use disorders (SUD). Self-compassion may be protective from NSSH, aligning with previous research findings. However, the absence of a correlation between NSSH and sexual or physical abuse suggests the presence of distinct coping mechanisms for different forms of abuse. The results of this study stress the crucial role of addressing childhood trauma and enhancing self-compassion in interventions aimed at reducing NSSH among vulnerable populations. Moving forward, comprehensive approaches that integrate trauma-informed care and self-compassion training are essential for fostering mental health and well-being in adolescents with SUD.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical Approval
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