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Investigating the mediating role of affect integration in the relationship between adverse childhood experiences and adulthood aggressive behaviors

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Abstract

Introduction: Considering the destructive consequences of aggression for the individual and society and the importance of identifying influencing factors, the present study investigated the mediating role of affect integration in the relationship between Adverse Childhood Experiences (ACEs) and aggression.

Materials and Methods: In an analytical cross-sectional study, 288 adults were selected from the general population of Iran in 2022. They responded to the short form of the childhood trauma questionnaire, risky, impulsive, and self-destructive behavior questionnaire, and the short form of the affect integration inventory. We analyzed the data using the Pearson correlation test, Fisher's z test, and structural equation modeling using SPSS version 26 and Mplus-8 software.

Results: There were negative correlations between aggression and affect integration components (from r= -0.36 to r= -0.42, *P*< 0.01) and positive correlations between aggression and ACEs (from r= 0.29 to r= 0.48, *P*< 0.01). The proposed model fit well with the data (RMSEA= 0.07, SRMR= 0.04, CFI= 0.95, TLI= 0.93). ACEs affected aggression both directly (β= 0.42, *P*< 0.01) and indirectly through the reduction of affect integration (β= 0.12, *P*< 0.01). Also, 34% of the total variance of affect integration and 32% of the total variance of aggression were explained by the model.

Conclusion: Based on the findings, adverse childhood experiences increase aggression both directly and indirectly by reducing affect integration.

Keywords: Aggression, Childhood trauma, Emotion regulation

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Introduction

Aggression refers to any behavior that is intended to cause physical or psychological harm to another person (1). The human suffering and economic burden caused by aggressive behaviors pose significant social challenges. For instance, in the UK, around 1.8 million violent crimes occur each year (2), and the prevalence of minor offenses or aggressive and antisocial acts that are not detected by the judicial system is significantly higher (3), which highlights the need to investigate the factors affecting it. One potential factor is Adverse Childhood Experiences (ACEs) (physical abuse, sexual abuse, emotional abuse, physical neglect, and emotional neglect), which have received increasing attention in recent decades (4). Studies have shown that child maltreatment not only increases the risk of aggressive and violent behavior in childhood and adolescence but also the risk of such behaviors in adulthood (5).

However, most studies in this area have been conducted on criminal populations, and the association between ACEs and aggressive behaviors in the general population, as well as the mediating mechanisms of this relationship, have been less studied (6), which the present study aims to address to the best of its ability to fill these gaps.

The phenomenon of children who have experienced maltreatment becoming perpetrators of violence in the future, often referred to as the cycle of violence. It has been the subject of extensive research, and various theoretical models have been proposed to explain this phenomenon (5). One of the key underlying factors that many of these models share is the concept of emotional processing, which is considered a potential mechanism for transmitting risk following maltreatment experiences (7). The assumption is that child maltreatment changes the emotional systems that reflect early adaptive changes in the context of threatening environments (6). Children repeatedly exposed to adverse events may develop threat detection processes that facilitate rapid responses to danger and mobilize safety behaviors. Over time, these heightened emotional responses can become overgeneralized and lead to disruptions in other emotional processing systems (8).

Consistent with this view, several studies have supported the mediating role of emotional regulation difficulties in the relationship between ACEs and adult problems (9). However, the role of other emotional systems, such as affect integration, has yet to be studied. Affect integration refers to utilizing adaptive features of different effects for personal adjustment (10). The development of affect integration depends on coordinating and fulfilling affective needs in early important relationships. If affects and needs are consistently ignored, unmet, or misinterpreted, integration can be damaged (11). Damage to the process of affect integration formation can lead to problems in personal and interpersonal functioning in adulthood due to the ACEs (11). Given the importance of identifying the mechanisms that mediate the relationship between ACEs and aggressive behaviors, as well as the lack of research on affect integration, its factors, and its consequences, this study aimed to investigate the mediating role of affect integration in the relationship between ACEs and aggressive behaviors in the general population.

Materials and Methods

The present cross-sectional study has a correlational design. The statistical population included all adults (18 to 65 years old) who lived in Iran—considering the estimated number of parameters to be estimated in the model ((12 observed variables × 3) + (2 latent endogenous variables × 2) + one exogenous current variable= 41) and the need for 5 to 10 samples per parameter (12), a sample size of around 300 was considered for the study. However, due to practical limitations, including internet restrictions in late September 2022 in Iran, sampling was limited to 288 people. Sampling was conducted online in the summer of 2022. Based on the inclusion criteria of being an adult and living in the society, anyone in the country who met these conditions could participate in the study. Sampling was voluntary and questionnaires online links were distributed through social networks only to those who expressed an interest in participating. The exclusion criterion was a lack of interest in completing the questionnaires, and there was no obligation to participate in the study.

Research instruments

A) Short Form of Childhood Trauma Questionnaire: This 28-item is a screening tool to identify individuals who have experienced

childhood trauma. This questionnaire measures five types of childhood trauma (sexual abuse, physical abuse, emotional abuse, emotional neglect, and physical neglect). The participants answer on a 5-point scale from 1= never to 5= always. The higher scores indicate more ACEs. The Cronbach's alpha coefficient on a group of teenagers for the subscales of emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect were 0.87, 0.86, 0.95, 0.89, and 0.78, respectively. Its concurrent validity with therapists' rating of the amount of childhood traumas has been reported in the range of 0.59 to 0.78 (13). In Iran, Cronbach's alpha for the five subscales calculated 0.81 to 0.98, and the factor structure of the questionnaire has been confirmed (14). In the present study, Cronbach's alpha for these five subscales has been reported 0.75 and 0.93.

B) Risky, Impulsive, and Self-Destructive Behavior Questionnaire (RISQ): To assess aggressive behaviors, the aggression subscale (comprising five questions) of the RISQ was used. The RISQ consists of 38 items designed to measure the general tendency to engage in risky and self-destructive behaviors across various domains. In each item, participants are asked to indicate how often they have engaged in these behaviors in the past month and over their lifetime. To reduce positive skewness, participants' responses to each item are first scored on a five-point scale (0, 1-10, 11-50, 51-100, and over 100 times). Then the scores of the items in each domain are summed to obtain the total score in that domain. A higher score in each domain indicates a greater tendency to engage in risky behaviors. In a psychometric study, the internal consistency of the total score of the questionnaire was found to be 0.92, and for the different domains (except for reckless behavior, which was 0.63), it ranged from 0.73 to 0.92. The factor structure of the questionnaire was also confirmed (15). In Iran, the Cronbach's alpha coefficient and the split-half reliability coefficient of the total score of the questionnaire were reported to be 0.91 and 0.91, respectively (16). In the present study, aggressive behaviors over the past three months were assessed, and the internal consistency of the five questions related to the aggression subscale was found to be 0.89 using Cronbach's alpha.

C) Short Form of Affect Integration Inventory (AII-SF-42): This scale is the short-form (42-item) of the Affect Integration Inventory (AII). This inventory includes 112 items about the understanding, awareness, tolerance, and experience of 9 distinct effects or emotions. The items describe how the respondent typically experiences or expresses each affect. In AII-SF-42, twenty-two items were designed to measure the ability to adaptively experience affects, and 20 items were designed to measure the ability to express affects adaptively. Each item is scored on a 10-point Likert scale from not at all true or "strongly disagree" (0) to completely true or "strongly agree" (9).

Higher scores indicate higher levels of affect integration. The obtained scores can be used at three levels (total score, two scores for experiencing and expressing affects, and nine scores for the nine different affects). The internal consistency, construct validity, and factor structure of this questionnaire have been established (17). In the present study, the Cronbach's alpha for the total questionnaire was 0.89 and for the experiencing and expressing affects subscales were 0.81 and 0.85, respectively.

After preparing the questionnaires, their online versions were designed, and the questionnaires online links were intentionally distributed on social networks to adults willing to participate in the research. The data was analyzed using Pearson's correlation test, Fisher's Z test, structural equation modeling, SPSS version 26 and M-plus software version 8.

Results

Demographic information indicated that of the 288 participants in the present study, 132 (45.8%) were male, 155 (53.8%) were female, 176 (61.1%) were single, and 112 (38.9%) were married. The mean age of the participants was 33.51 ± 12.27. Information on aggressive behaviors indicated that 33.7% of individuals had exhibited at least one aggressive behavior in the past three months. Getting into a fight was the most common behavior, and using a knife or gun to threaten or attack someone was the rarest aggressive behavior.

A correlation test was used to examine the relationship between aggression and affect integration with ACEs. Before performing the test, the distribution of the scores was examined by calculating skewness and kurtosis. The results showed that the distribution of the scores of all variables was within the acceptable range (less than the absolute value of 3 for skewness and less than the absolute value of 10 for kurtosis) (18).

Table 1. Mean, standard deviation, and correlation coefficients of variables

Variable	Mean	Standard deviation	Aggression	Affect experience	Affect expression	Affect integration
Aggression	1.05	1.66				
Affect experience	5.50	1.24	-0.39**			
Affect expression	5.07	1.43	-0.36**	0.60**		
Affect integration	5.29	1.19	-0.42**	0.89**	0.90**	
Emotional abuse	5.70	3.61	0.48**	-0.46**	-0.29**	-0.41**
Physical abuse	6.57	2.72	0.39**	-0.40**	-0.26**	-0.37**
Sexual abuse	6.58	3.04	0.29**	-0.34**	-0.24**	-0.32**
Emotional neglect	10.36	5.582	0.43**	-0.52**	-0.31**	-0.46**
Physical neglect	8.89	4.04	0.40**	-0.51**	-0.33**	-0.46**

**P< 0.01, *P< 0.05

Pearson correlation results showed a negative correlation (from r= -0.36 to r= -0.42) between aggression and the components of affect integration and a positive correlation (from r= 0.29 to r= 0.48) between aggression and ACEs. All correlations were significant at the 1% error level (P< 0.01). Additionally, a significant negative correlation (from r= -0.24 to r= -0.52) exists between the components of affect integration and ACEs. A closer look at the correlation coefficients, using Fisher's z test, revealed that among ACEs, sexual abuse had a lower positive correlation with aggression than emotional abuse (Fisher's z= -2.68, P< 0.01) and emotional neglect (Fisher's z= -1.93, P< 0.05). Sexual abuse also had a lower negative correlation with affect integration than emotional neglect (Fisher's z= -1.98, P< 0.05) and physical neglect (Fisher's z= -1.98, P< 0.05). In addition, the mean correlation of affect experience with ACEs (Mr=-0.44) was higher than that of affect expression (Mr= -0.29) (Fisher's z= 2.2, P< 0.05).

We applied structural equation modeling with maximum likelihood estimation to investigate the mediating role of affect integration in the relationship between ACEs and aggressive behaviors. While the initial model fit was satisfactory, minor modifications (connecting the error covariance of aggression question 3 to question 5 and the error covariance of physical abuse to sexual abuse) were made to improve the fit indices. The analysis results (Figure 1) indicate that the final model fits the data well (X2/df= 2.66, RMSEA= 0.08, SRMR= 0.04, CFI= 0.97, TLI= 0.95).

The bootstrap method with 5000 replications was used to examine the mediating role. The results demonstrated that ACEs lead to increased aggression in individuals both directly (β= 0.42, P< 0.01) and indirectly (β= 0.12, P< 0.01) through a decrease in affect integration. Thirty-four percent of the total variance of affect integration and 32 percent of the total variance of aggression were explained by the variables included in the model.

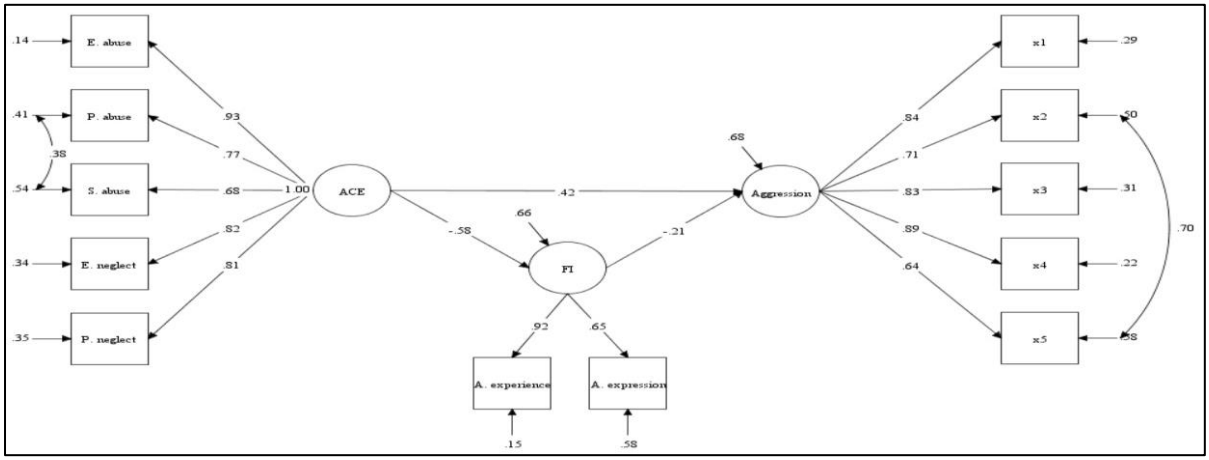

Figure 1. The mediating role of affect integration in the relationship between adverse childhood experiences and aggressive behaviors.

Discussion

The correlation test results indicated a negative correlation between aggression and the components of affect integration (experience and expression of affects). Despite the absence of prior research, it is evident that the capacity to regulate and utilize affects and emotions purposefully correlates with reduced aggressive behavior. Additionally, according to the negative relationship between aggression and the ability to regulate emotions (a construct close to affect integration) in various studies (19), these findings can be considered consistent with previous research. For example, in the most recent research, Garofalo et al. (20) in a sample of violent offenders and a sample of society, Herrero-Fernández et al. (21) in a study on drivers, and Oliva et al. (22) in a review study of borderline personality disorder showed that there is a relationship between emotion dysregulation and aggression. Furthermore, the correlation between affect experience and affect expression with aggression was not significant. It can be said that aggression is not simply a problem in expressing affects, and how affects and emotions are experienced can lead to aggressive behaviors to the same extent.

Another result of the correlation test was a positive correlation between aggression and ACEs, meaning that the more ACEs are reported, the more likely aggressive behaviors will be committed. This finding is consistent with various studies (5). For example, Oei et al. (23) in a relatively large sample of youth offenders (n= 1130), James et al. (24) in a criminal sample, and Maneiro et al. (25) in a sample of adolescents in out-of-home care showed that there is a relationship between ACEs and aggression.

However, what makes the present finding important is that previous research has mainly focused on delinquent and criminal adolescents and young adults. As a result, the present study extends previous results to show that having ACEs is also associated with aggressive behaviors in a general adult population with normal lives.

Several theoretical models, such as social learning theory, general strain theory, and information processing theory, have supported the association between ACEs and adult aggression (5). Although, according to the present findings, it is not possible to say with certainty which of these views is more correct. A careful examination of the obtained correlations can help to clarify the relationship between ACEs and aggression in adulthood. The results indicated that emotional abuse and emotional neglect had the highest correlation, while sexual abuse had the lowest correlation with aggression, and these differences were statistically significant. Given that sexual abuse is considered the most severe type of abuse and is assumed to be associated with more severe consequences, this finding was not expected. However, it demonstrates that the type of abuse predicts the outcome more significantly than its severity. These findings align with the general strain theory, suggesting that aggression may function as an ineffective coping mechanism for managing unavoidable negative emotions stemming from adversity and stress. This disruption in the emotional processing system, resulting from ACEs leads to aggressive behavior in adulthood. The negative correlation between ACEs and affect integration, along with the supporting evidence for affect integration mediating the relationship between ACEs and aggression, provides additional support for this hypothesis.

In addition to the theoretical basis, empirical findings support the mediating role of affect integration in the relationship between ACEs and aggression. For example, McLaughlin et al. (8) showed that increased excitability and poor emotion regulation are not only consequences of child maltreatment but can also act as mechanisms that link child maltreatment to adult psychopathology. Poole et al. (9) also supported the mediating role of emotion dysregulation in the relationship between ACEs and adult problems, which can be generalized to affect integration due to the similarity between the constructs of affect integration and emotion regulation.

It is assumed that child maltreatment leads to changes in affect systems that reflect early adaptive changes in the context of threatening environments. So that children who are repeatedly exposed to threatening events develop threat detection processes that facilitate rapid responses to danger and mobilize safety behaviors. Over time, this heightened emotional response can become overgeneralized, leading to disruptions in other emotional processing systems (such as experiencing and expressing affects) (6). A closer look at the correlations found between ACEs and components of affect integration, on

the one hand, showed that all types of neglect had a higher negative correlation with affect integration than sexual abuse, and on the other hand, experiencing effect had a stronger correlation with ACEs than expressing effect. These findings suggest that, first, the formation of affect integration in individuals requires fulfilling their emotional and physical needs during childhood. Secondly, the non-fulfillment of these needs in childhood is more likely to lead to impairment in the experience of affects (possibly in the form of an intensification of the experience of negative emotions).

The present study has some limitations that limit the generalizability of results. Due to the retrospective nature, the reported childhood experiences may be more influenced by individuals' current emotional state.

Additionally, since the sampling was stopped earlier than usual due to internet limitations created in late September 2022 in Iran, conducting further research with different methods and more comprehensive samples could lead to greater confidence in the findings. According to the findings indicated the mediating role of affect integration in the relationship between ACEs and adult aggression, designing interventions aimed at enhancing affect integration could lead to a reduction in aggression in prone individuals.

Conclusion

The findings of this study indicate that ACEs, including emotional abuse, emotional neglect, and physical neglect, are a significant risk factor for adult aggressive behaviors in the general population. ACEs lead to direct and indirect aggression through a reduction in affect integration, particularly making it difficult to experience effects.

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Conflict of Interest

The authors reported no conflicts of interest.

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Ethical Considerations

This study has been registered in the Ethics Committee of Kermanshah University of Medical Sciences.

Code of Ethics

IR.KUMS.REC.1401.248.

Authors' Contribution

Conceptualization: First author, Data analysis: First author, Drafting the manuscript: First author, Data collection: Second author, Study design: All authors, Final review: All authors

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