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The Impact of Childhood Maltreatment on Aggression in Elementary School Students: The Mediating Role of Callous-Unemotional Traits and Self-Control

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ABSTRACT

Purpose: The present study aimed to investigate the effect of childhood maltreatment on aggression among elementary school students with the mediating roles of callous-unemotional traits and self-control.

Methods and Materials: The present study was applied in terms of purpose and descriptive-survey in terms of methodology. The statistical population consisted of male and female lower secondary school students in Lahijan during 2025, from whom 359 participants were selected using the Krejcie and Morgan table and stratified random sampling. Data were collected using the Aggression Questionnaire (AQ) developed by Arnold H. Buss and Mark Perry (1992), the Childhood Trauma Questionnaire developed by David P. Bernstein et al. (2003), the Callous-Unemotional Traits Scale developed by Paul J. Frick et al. (2006), and the Self-Control Scale developed by June P. Tangney et al. (2004). Data analysis was conducted using descriptive statistics, the Kolmogorov-Smirnov test, and Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) approach using SmartPLS software at a 95% confidence level.

Findings: The findings demonstrated that childhood maltreatment had a significant positive effect on aggression ($\beta = 0.485$, $t = 8.390$) and callous-unemotional traits ($\beta = 0.587$, $t = 15.096$), while it had a significant negative effect on self-control ($\beta = -0.630$, $t = 18.692$). In addition, callous-unemotional traits positively predicted aggression ($\beta = 0.267$, $t = 4.970$), whereas self-control negatively predicted aggression ($\beta = -0.214$, $t = 4.262$). The bootstrapping results further indicated that callous-unemotional traits and self-control significantly mediated the relationship between childhood maltreatment and aggression. The structural model also demonstrated satisfactory fit and predictive power ($GOF = 0.392$).

Conclusion: The findings suggest that childhood maltreatment contributes to aggressive behavior among students both directly and indirectly through emotional and self-regulatory mechanisms. Specifically, exposure to maltreatment increases callous-unemotional traits and reduces self-control, which subsequently intensify aggressive tendencies.

Keywords: Childhood maltreatment, aggression, callous-unemotional traits, self-control

1. Introduction

Aggression among children and adolescents has long been recognized as one of the major psychological, educational, and social challenges affecting individual adjustment, academic functioning, and future social relationships. Aggressive behaviors in school settings not only disrupt the educational environment but also contribute to emotional, behavioral, and interpersonal difficulties that may persist into adolescence and adulthood. Research has shown that childhood aggression is associated with delinquency, poor social adjustment, academic failure, emotional dysregulation, and antisocial tendencies (Broidy et al., 2003; Roff & Wirt, 1984). Because aggressive behaviors can significantly affect psychological well-being and social development, identifying the underlying factors contributing to aggression has become an important focus in developmental and educational psychology.

One of the most influential antecedents of aggressive behavior is childhood maltreatment. Childhood maltreatment encompasses a wide range of harmful experiences, including emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Exposure to these adverse childhood experiences can disrupt emotional development, impair interpersonal functioning, and negatively affect cognitive and behavioral regulation (Nowbahari, 2020; Sabouripour & Haghbin, 2023). Childhood maltreatment has consistently been associated with behavioral problems, emotional instability, poor impulse control, and aggression across developmental stages. Recent evidence suggests that individuals exposed to maltreatment during childhood are more likely to exhibit externalizing behaviors and antisocial tendencies later in life (Xie et al., 2020; Zhang et al., 2025). Such findings indicate that adverse childhood experiences may create maladaptive emotional and cognitive patterns that increase vulnerability to aggressive reactions.

Theoretical perspectives in developmental psychopathology suggest that maltreatment interferes with the formation of healthy emotional regulation systems and social cognition. Children exposed to hostile or neglectful family environments often internalize maladaptive interaction patterns and may perceive social situations as threatening or hostile. Consequently, they become more likely to respond aggressively during interpersonal interactions. Social information processing theory proposes that aggressive individuals tend to misinterpret social cues, attribute hostile intentions to others, and select maladaptive

responses during social conflicts (Nas et al., 2005). Childhood maltreatment may therefore contribute to distorted cognitive schemas and emotional dysregulation, which subsequently increase aggressive behaviors.

In addition to cognitive distortions, emotional deficits have been identified as another important mechanism linking childhood maltreatment and aggression. Among these emotional characteristics, callous-unemotional traits have received considerable scholarly attention. Callous-unemotional traits refer to a pattern of diminished empathy, reduced guilt, emotional coldness, and lack of concern for others. Individuals with elevated callous-unemotional traits often demonstrate reduced emotional responsiveness, impaired moral emotions, and increased risk for antisocial behavior (Fanti, 2013). Studies have shown that children and adolescents with high levels of callous-unemotional traits are more likely to exhibit aggression, conduct problems, and delinquent behaviors.

Recent empirical evidence indicates that childhood maltreatment is strongly associated with the development of callous-unemotional traits. Exposure to abusive or neglectful environments may hinder the normal development of empathy, emotional attachment, and emotional understanding. Children who experience chronic rejection, violence, or emotional deprivation may gradually become emotionally detached and less responsive to the emotions of others as a defensive coping mechanism. A meta-analysis conducted by Todorov and colleagues confirmed a significant association between childhood maltreatment and callous-unemotional traits among youth (Todorov et al., 2023). Similarly, Dackis and colleagues demonstrated that maltreated children with elevated callous-unemotional traits exhibit impaired emotional responding and defensive reactivity (Dackis et al., 2015). These findings suggest that callous-unemotional traits may function as a psychological pathway through which childhood maltreatment contributes to aggressive and antisocial behaviors.

Another variable that may play a critical role in the relationship between childhood maltreatment and aggression is self-control. Self-control refers to the ability to regulate emotions, impulses, thoughts, and behaviors in accordance with social norms and long-term goals. Individuals with high self-control are generally more capable of managing emotional reactions, delaying gratification, and inhibiting impulsive behaviors (Tangney et al., 2004). Conversely, low self-control has been associated with impulsivity, emotional instability, aggression, and delinquent behavior. Children who experience maltreatment may have fewer opportunities

to develop adaptive self-regulatory capacities because stressful and chaotic family environments often interfere with emotional learning and behavioral regulation.

Research has consistently shown that deficits in self-control are associated with aggressive and antisocial behaviors. Children with low self-control may respond impulsively during interpersonal conflicts and exhibit greater difficulty managing anger and frustration. Moreover, childhood maltreatment can negatively affect the development of executive functioning and self-regulatory mechanisms, thereby increasing vulnerability to aggression (Zhang et al., 2025). Tangney and colleagues reported that individuals with higher self-control demonstrate better psychological adjustment, stronger interpersonal functioning, and fewer behavioral problems (Tangney et al., 2004). These findings emphasize the protective role of self-control in preventing maladaptive and aggressive behaviors.

Recent studies have increasingly focused on the simultaneous role of emotional and self-regulatory factors in explaining aggression. Xie and colleagues demonstrated that callous-unemotional traits and self-control mediate the relationship between childhood maltreatment and aggression among juvenile offenders in China (Xie et al., 2020). Their findings suggested that maltreatment contributes to aggression both directly and indirectly through impaired emotional responsiveness and reduced self-control. Similarly, Carlson and colleagues found that callous-unemotional traits and conscientiousness play significant roles in explaining risky and aggressive behaviors among maltreated youth (Carlson et al., 2015). These findings highlight the importance of examining both emotional deficits and behavioral self-regulation simultaneously when investigating aggressive behaviors.

In educational environments, aggression among students represents a serious challenge for teachers, families, and school systems. Aggressive behaviors can undermine peer relationships, reduce academic engagement, and negatively affect classroom climate. Educational psychologists have therefore emphasized the importance of identifying early predictors of aggression in order to design effective preventive interventions. Studies have shown that interventions focused on emotional regulation, moral education, social skills, and self-control can reduce aggressive tendencies among students (Ghalamkarian & Keyhani, 2021; Rajabi et al., 2013). Moral and character education programs also appear to strengthen empathy, emotional understanding, and prosocial behaviors among

children and adolescents (Aghili et al., 2018; Marwan et al., 2025).

The increasing influence of digital environments and social changes has further intensified concerns regarding children's behavioral and emotional development. Contemporary educational systems are increasingly expected to foster ethical values, emotional competencies, and self-regulatory skills alongside academic achievement (Marwan et al., 2025). In this context, moral education and character cultivation during childhood are considered essential protective factors against behavioral problems and aggression. Norouzi and colleagues emphasized the importance of integrating moral character cultivation into educational curricula in order to support healthy emotional and social development among students (Norouzi et al., 2025). Such approaches may contribute to reducing aggressive tendencies and strengthening adaptive interpersonal functioning.

From a developmental perspective, aggression is not merely an isolated behavioral problem but rather a multifaceted phenomenon influenced by emotional, cognitive, familial, and environmental factors. Longitudinal evidence suggests that aggressive and disruptive behaviors during childhood may persist into adolescence and adulthood if left unaddressed (Broidy et al., 2003; Roff & Wirt, 1984). Consequently, understanding the mechanisms through which childhood maltreatment contributes to aggression is essential for designing targeted interventions and preventive strategies. Identifying mediating variables such as callous-unemotional traits and self-control may provide valuable insight into the psychological pathways linking adverse childhood experiences and maladaptive behaviors.

Although previous studies have separately examined the relationships among childhood maltreatment, callous-unemotional traits, self-control, and aggression, limited research has simultaneously investigated the mediating roles of callous-unemotional traits and self-control among school students, particularly in educational contexts. Moreover, cultural and social differences may influence how childhood maltreatment affects emotional and behavioral outcomes, highlighting the importance of conducting context-specific research. Shirazi Fardoui and colleagues demonstrated that self-regulatory mechanisms play important mediating roles in the relationship between childhood trauma and maladaptive personality characteristics (Shirazi Fardoui et al., 2024). Similarly, Pourjabbar Ahangarkolai found that self-control mediates the relationship between parent-child

interaction and aggression among students (Pourjabbar Ahangarkolai, 2024). However, further investigation is needed to clarify the simultaneous mediating roles of callous-unemotional traits and self-control in the relationship between childhood maltreatment and aggression.

Furthermore, emotional intelligence and affective functioning have also been identified as influential factors associated with aggression. Gao and colleagues reported that children's emotional intelligence influences aggressive behavior through positive and negative affective states (Gao et al., 2023). Such findings indicate that emotional processing and regulation are central mechanisms underlying aggressive tendencies. Since callous-unemotional traits involve deficits in emotional responsiveness and empathy, examining their role in aggression becomes particularly important in developmental research.

Considering the serious consequences of aggression during childhood and adolescence, identifying psychological mechanisms associated with aggressive behavior may contribute to the development of effective prevention and intervention programs. Understanding how childhood maltreatment influences aggression through emotional and self-regulatory pathways can help educators, psychologists, and policymakers design evidence-based strategies aimed at promoting healthy emotional development and reducing behavioral problems among students. Therefore, the present study aimed to investigate the effect of childhood maltreatment on aggression among elementary school students with the mediating roles of callous-unemotional traits and self-control.

2. Methods and Materials

2.1. Study Design and Participants

The present study was descriptive in nature and survey-based in terms of methodology, while in terms of purpose, it was applied research. The statistical population consisted of male and female lower secondary school students in Lahijan during the year 2025. The sample size was determined to be 359 participants using the Krejcie and Morgan table. In order to examine and compare the role of respondents' demographic characteristics, stratified random sampling was employed. Data collection was conducted using both library-based and field methods.

2.2. Measures

The research instruments included the original version of the Aggression Questionnaire (AQ) developed by Arnold H. Buss and Mark Perry (1992), consisting of 29 items and four subscales (physical aggression, verbal aggression, anger, and hostility), scored on a five-point Likert scale ranging from "completely like me" to "not at all like me." The Childhood Trauma Questionnaire-Short Form (CTQ-SF), developed by David P. Bernstein et al. (2003), consisted of 25 items. The Callous-Unemotional Traits Scale developed by Paul J. Frick et al. (2006) included 24 items. The Self-Control Scale (SCS), originally developed by June P. Tangney et al. (2004), consisted of 36 items and five subscales (self-discipline, impulsivity, healthy habits, work ethic, and reliability), scored on a five-point Likert scale ranging from "does not apply to me at all" to "applies to me very much." In the present study, the validity of the instruments was confirmed through the opinions of professors and experts in the field of psychology. Prior to the main administration, the reliability of the questionnaires was assessed using a pilot sample of 15 participants. Cronbach's alpha coefficients for the aggression, childhood maltreatment, callous-unemotional traits, and self-control questionnaires were all greater than 0.70, indicating satisfactory reliability.

2.3. Data Analysis

The collected data were first analyzed descriptively using mean and standard deviation. Subsequently, the Kolmogorov-Smirnov test was employed to examine the normality of data distribution. Finally, Structural Equation Modeling (SEM) using SmartPLS statistical software was applied to test the research hypothesis and evaluate the effects of independent and mediating variables on the dependent variable.

3. Findings and Results

In the present study, the sample consisted of 359 participants. Regarding gender distribution, 55.91% of the participants were female and 44.01% were male. In terms of age, the majority of participants (38.72%) were 14 years old, whereas the smallest proportion (28.41%) were 15 years old. Regarding educational grade level, most participants (39.27%) were in the eighth grade, while the fewest (29.53%) were in the ninth grade. This demographic distribution indicates that the sample had an appropriate

diversity in terms of gender, age, and educational level, and that the groups were relatively homogeneous regarding

demographic characteristics, thereby enhancing the validity of the research findings.

Table 1

Descriptive Findings of the Research Variables

| Research Variables | Mean | Standard Deviation |
|----------------------------|--------|--------------------|
| Aggression | 68.19 | 20.64 |
| Childhood Maltreatment | 64.01 | 15.98 |
| Callous-Unemotional Traits | 61.77 | 13.79 |
| Self-Control | 125.26 | 21.00 |

Table 1 presents the descriptive findings related to the mean and standard deviation of the main research variables. As observed, the mean score of aggression ($M = 68.19$, $SD = 20.64$) was at a moderate level among the studied sample. Childhood maltreatment was also reported with a mean of 64.01 ($SD = 15.98$), while callous-unemotional traits had a mean of 61.77 ($SD = 13.79$). Finally, the highest mean score was related to self-control ($M = 125.26$, $SD = 21.00$).

To examine the normality of the distribution of research variables, the Kolmogorov–Smirnov test was conducted. The results indicated that the significance level for all research variables (aggression, childhood maltreatment, callous-unemotional traits, and self-control) was less than

0.05. Therefore, all research variables exhibited non-normal distributions.

In this section, the statistical analysis related to the research hypothesis—that callous-unemotional traits and self-control mediate the effect of childhood maltreatment on aggression among elementary school students—is presented using Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) approach.

Considering that the research variables consisted of several dimensions, the Kaiser–Meyer–Olkin (KMO) index and Bartlett’s Test of Sphericity were employed to assess the adequacy of the data for confirmatory factor analysis. The results of these tests are presented in Table 2.

Table 2

KMO and Bartlett’s Test for Questionnaire Items

| Index | Value | Interpretation |
|--------------------|----------------------|----------------------------|
| KMO Test | 0.673 | Acceptable sample adequacy |
| Bartlett’s Test | $\chi^2 = 35369.663$ | Significant |
| Degrees of Freedom | 6441 | — |
| Sig. | 0.001 | — |

As shown, the KMO index value of 0.673 exceeded the minimum acceptable threshold of 0.60, indicating moderate but acceptable data adequacy for factor analysis. Furthermore, the significance of Bartlett’s test at $P \leq 0.01$ demonstrated that the correlation matrix among variables was suitable for confirmatory factor analysis and that the data possessed adequate factorability.

In the present study, factor loadings, Cronbach’s alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) were used to evaluate convergent validity, construct reliability, and the adequacy of the measurement model. The findings related to these indices for each item and construct are presented in Table 3.

Table 3

Factor Loadings, Significance Statistics, Cronbach’s Alpha, Composite Reliability, and AVE for the Questionnaires

| Construct (Latent Variable) | Indicator | AVE | Composite Reliability | Cronbach’s Alpha |
|-----------------------------|-------------------|-------|-----------------------|------------------|
| Childhood Maltreatment | Emotional Abuse | 0.511 | 0.838 | 0.758 |
| | Physical Abuse | 0.550 | 0.859 | 0.794 |
| | Sexual Abuse | 0.569 | 0.868 | 0.810 |
| | Emotional Neglect | 0.511 | 0.836 | 0.751 |
| | Physical Neglect | 0.637 | 0.897 | 0.857 |

| | | | | |
|----------------------------|-------------------|---------------|---------------|---------------|
| Callous-Unemotional Traits | Callousness | 0.452 (0.508) | 0.886 (0.899) | 0.856 (0.884) |
| | Uncaring | 0.540 | 0.891 | 0.857 |
| | Unemotional | 0.559 | 0.899 | 0.868 |
| Self-Control | Self-Discipline | 0.505 | 0.885 | 0.854 |
| | Deliberate Action | 0.531 (0.540) | 0.885 (0.893) | 0.845 (0.857) |
| | Healthy Habits | 0.516 | 0.864 | 0.813 |
| | Work Ethic | 0.501 | 0.849 | 0.785 |
| Aggression | Reliability | 0.545 | 0.915 | 0.894 |
| | Physical | 0.514 | 0.904 | 0.883 |
| | Verbal | 0.753 | 0.938 | 0.918 |
| | Anger | 0.595 | 0.911 | 0.886 |
| | Hostility | 0.607 | 0.925 | 0.907 |

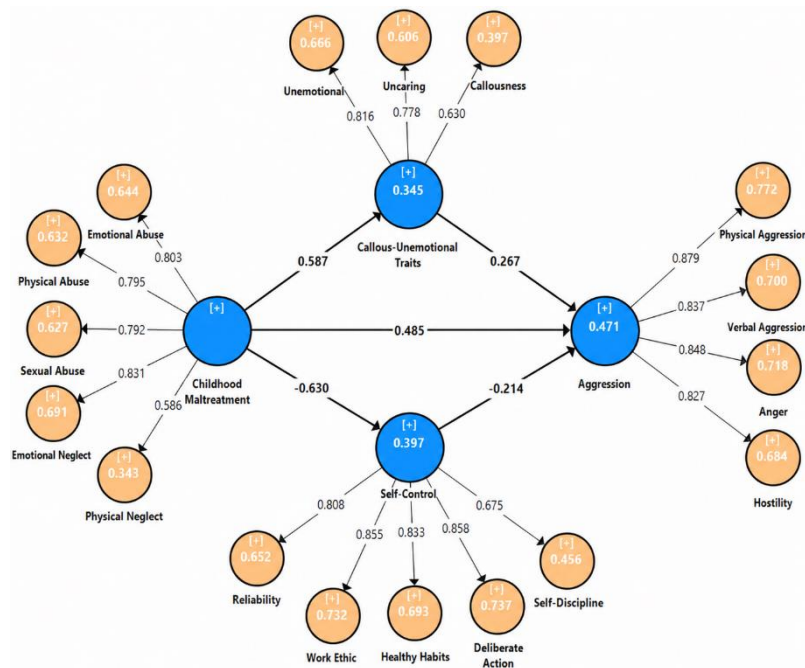
The factor loadings obtained from the Childhood Maltreatment Questionnaire indicated that none of the items had loadings lower than 0.50; therefore, no items were removed from the analysis. The factor loadings from the Callous-Unemotional Traits Questionnaire demonstrated that Items 8 (0.424) and 10 (0.385) in the callousness dimension were below 0.50; therefore, these items were removed from subsequent analyses. The factor loadings from the Self-Control Questionnaire showed that Item 12 (0.454) in the deliberate action dimension was below 0.50; therefore, this item was also removed from further analysis. The values presented in parentheses were recalculated after removing items with factor loadings lower than 0.50. The factor loadings obtained from the Aggression Questionnaire indicated that none of the items had loadings lower than 0.50; therefore, no items were removed from the analysis.

Furthermore, the AVE values for all variables exceeded the acceptable threshold of 0.50. In addition, the square root of AVE for each factor was greater than its correlations with other factors, confirming discriminant validity. Cronbach's alpha values for all constructs exceeded 0.70, indicating high convergent validity and construct reliability for the latent variables in terms of model fit. Moreover, the Composite Reliability (CR) values for all constructs were reported to be above 0.70, demonstrating satisfactory composite reliability for the constructs (Table 3).

After confirming the adequacy of the measurement model, the structural model of the research was tested. Figure 1 illustrates the graphical representation of the conceptual research model along with the standardized path coefficients.

Figure 1

Standardized Path Coefficients of the Conceptual Research Model



To test the significance of path coefficients in the structural model, the bootstrapping method was employed. The results indicated that all path coefficients were significant at the 0.05 level, with calculated T-statistics greater than 1.96.

The fit of the structural model was evaluated using the key indices R^2 (coefficient of determination), Q^2 (predictive relevance), and GOF (goodness-of-fit index). These indices respectively indicate the model's ability to explain the variance of endogenous variables, its predictive power, and the overall model fit. The results are summarized in Table 4.

Table 4

R² Values of the Research Variables

| Row | Variable | R ² | Q ² | GOF |
|-----|----------------------------|----------------|----------------|-------|
| 1 | Callous-Unemotional Traits | 0.345 | 0.173 | 0.392 |
| 2 | Self-Control | 0.397 | 0.234 | — |
| 3 | Aggression | 0.471 | 0.309 | — |

Table 4 indicates that the GOF value of 0.392, which is higher than the desirable threshold of 0.36, demonstrates a satisfactory overall model fit. The R^2 values for endogenous variables, including aggression (0.471), self-control (0.397), and callous-unemotional traits (0.345), indicate acceptable explanatory power for these constructs. Furthermore, the positive Q^2 values for aggression (0.309), self-control (0.234), and callous-unemotional traits (0.173) suggest adequate predictive power of the model regarding the endogenous constructs. Overall, the desirable values of

GOF, R^2 , and Q^2 indicate that the structural model of the research has good overall fit and appropriate explanatory power for the endogenous constructs.

To examine the hypothesis concerning the mediating role of callous-unemotional traits and self-control in the relationship between childhood maltreatment and aggression among elementary school students, the bootstrapping method was used. Based on the results presented in Table 5, the significance or non-significance of the indirect paths through these two mediators was evaluated.

Table 5

Bootstrapping Results for Examining the Significance of Indirect Effects

| Independent Variable | Mediating Variable | Dependent Variable | Indirect Effect | Upper Bound | Lower Bound | t-Statistic | Standard Error | Significance Level |
|------------------------|----------------------------|--------------------|-----------------|-------------|-------------|-------------|----------------|--------------------|
| Childhood Maltreatment | Callous-Unemotional Traits | Aggression | 0.157 | 0.227 | 0.094 | 4.773 | 0.033 | 0.001 |
| Childhood Maltreatment | Self-Control | Aggression | 0.134 | 0.199 | 0.073 | 3.351 | 0.051 | 0.001 |

According to Table 5, the bootstrapping results for examining the significance of indirect effects indicate that in both mediation pathways, the significance level was lower than 0.05, and the lower and upper confidence interval bounds did not include zero. Therefore, the indirect effect of childhood maltreatment on aggression among elementary

school students through the mediators of callous-unemotional traits and self-control was significant. Accordingly, callous-unemotional traits and self-control play mediating roles in the effect of childhood maltreatment on aggression among elementary school students.

Table 6

Results of Structural Model Evaluation for Testing the Research Hypotheses

| Row | Path | Path Coefficient (β) | t-Value | Test Result |
|-----|---|------------------------------|---------|-----------------------------|
| 1 | Childhood Maltreatment → Callous-Unemotional Traits | 0.587 | 15.096 | Confirmed (Positive Effect) |
| 2 | Childhood Maltreatment → Aggression | 0.485 | 8.390 | Confirmed (Positive Effect) |
| 3 | Childhood Maltreatment → Self-Control | -0.630 | 18.692 | Confirmed (Negative Effect) |
| 4 | Callous-Unemotional Traits → Aggression | 0.267 | 4.970 | Confirmed (Positive Effect) |
| 5 | Self-Control → Aggression | -0.214 | 4.262 | Confirmed (Negative Effect) |

According to Table 6, the significance statistics for the relationships among the research variables indicate that the relationships between childhood maltreatment and aggression ($t = 8.390$), childhood maltreatment and callous-unemotional traits ($t = 15.096$), childhood maltreatment and self-control ($t = 18.692$), callous-unemotional traits and aggression ($t = 4.970$), and self-control and aggression ($t = 4.262$) were significant at the 95% confidence level. Moreover, the path coefficients indicated that childhood maltreatment had a positive and direct effect on aggression ($\beta = 0.485$) and callous-unemotional traits ($\beta = 0.587$), while callous-unemotional traits also demonstrated a positive and direct effect on aggression ($\beta = 0.267$). In contrast, childhood maltreatment had a negative and significant effect on self-control ($\beta = -0.630$), and self-control also showed a negative and significant effect on aggression ($\beta = -0.214$). Therefore, the research hypotheses were confirmed.

4. Discussion and Conclusion

The present study aimed to investigate the effect of childhood maltreatment on aggression among elementary school students with the mediating roles of callous-unemotional traits and self-control. The findings demonstrated that childhood maltreatment had a significant positive effect on aggression and callous-unemotional traits and a significant negative effect on self-control. Furthermore, callous-unemotional traits positively predicted aggression, whereas self-control negatively predicted aggression. The results also confirmed the mediating roles of callous-unemotional traits and self-control in the relationship between childhood maltreatment and aggression. Overall, the structural model demonstrated acceptable explanatory and predictive power, indicating that emotional and self-regulatory mechanisms play substantial roles in explaining how adverse childhood experiences contribute to aggressive behavior among students.

One of the primary findings of the present study was that childhood maltreatment had a direct and significant positive effect on aggression among elementary school students. This finding is consistent with previous research indicating that children exposed to abuse and neglect are more likely to develop aggressive and antisocial behaviors (Nowbahari, 2020; Xie et al., 2020; Zhang et al., 2025). Childhood maltreatment creates an emotionally insecure and psychologically threatening environment that may disrupt healthy emotional development and interpersonal trust. Children who experience harsh parenting, neglect, or

emotional rejection often learn maladaptive behavioral responses and become more prone to hostile reactions during social interactions. In line with developmental psychopathology theories, repeated exposure to violence or neglect may normalize aggression as an acceptable means of emotional expression or conflict resolution. These experiences impair emotional security and contribute to emotional dysregulation, impulsivity, and behavioral instability.

The findings of the present study are also congruent with the work of Broidy and colleagues, who demonstrated that disruptive and aggressive childhood behaviors are associated with later delinquency and antisocial outcomes (Broidy et al., 2003). Similarly, Roff and Wirt emphasized that childhood aggression and poor social adjustment are important antecedents of future behavioral problems (Roff & Wirt, 1984). The current findings therefore reinforce the idea that aggressive behavior among children is not merely a temporary behavioral issue but may represent the outcome of broader developmental disturbances rooted in adverse family experiences. When children are deprived of emotional support and secure attachment relationships, they may become more vulnerable to frustration, hostility, and aggressive responding.

Another important finding of the present study was that childhood maltreatment significantly predicted callous-unemotional traits. This finding supports previous studies suggesting that abusive and neglectful childhood experiences contribute to emotional detachment, lack of empathy, and reduced guilt (Dackis et al., 2015; Todorov et al., 2023). Children who grow up in emotionally hostile environments may suppress emotional responsiveness as a defensive adaptation against chronic stress and emotional pain. Over time, this defensive emotional distancing may evolve into stable callous-unemotional characteristics, including emotional coldness, reduced empathy, and diminished concern for others. Such emotional deficits interfere with moral development and increase vulnerability to aggressive and antisocial behaviors.

The findings are also consistent with the work of Fanti, who reported that callous-unemotional traits mediate the relationship between various risk factors and antisocial behavior during adolescence (Fanti, 2013). Children with elevated callous-unemotional traits often demonstrate diminished emotional sensitivity and reduced responsiveness to punishment or social disapproval. Consequently, they may engage in aggressive behaviors without experiencing significant remorse or emotional

discomfort. The present findings suggest that childhood maltreatment may contribute to aggression partly through the development of emotional insensitivity and impaired empathic functioning. This interpretation aligns with emotional processing theories, which propose that repeated exposure to traumatic or emotionally neglectful experiences can disrupt the development of healthy emotional awareness and interpersonal sensitivity.

The present study also found that childhood maltreatment had a significant negative effect on self-control. This finding is consistent with previous research emphasizing the detrimental impact of adverse childhood experiences on self-regulatory capacities (Tangney et al., 2004; Xie et al., 2020). Self-control is a fundamental psychological ability that enables individuals to regulate impulses, manage emotions, and engage in goal-directed behavior. The development of self-control is strongly influenced by early family experiences and environmental stability. Children raised in abusive or chaotic environments may struggle to develop adaptive emotional regulation strategies because chronic stress and emotional insecurity interfere with executive functioning and behavioral regulation.

This finding can also be interpreted within the framework of self-regulation theory. Childhood maltreatment often exposes children to persistent stress, fear, and emotional instability, which can weaken cognitive control processes and reduce the ability to regulate impulses effectively. Tangney and colleagues reported that individuals with high self-control exhibit better psychological adjustment, healthier interpersonal relationships, and lower levels of behavioral pathology (Tangney et al., 2004). Therefore, reduced self-control among maltreated children may increase vulnerability to impulsive and aggressive reactions during emotionally challenging situations.

The findings further indicated that self-control negatively predicted aggression. Students with higher levels of self-control demonstrated lower levels of aggressive behavior. This result is consistent with previous findings suggesting that self-control functions as a protective factor against aggression and antisocial conduct (Pourjabbar Ahangarkolai, 2024; Tangney et al., 2004). Children who possess stronger self-regulatory abilities are generally better able to inhibit impulsive reactions, tolerate frustration, and manage interpersonal conflicts constructively. In contrast, children with poor self-control may react impulsively during stressful or provocative situations, increasing the likelihood of aggressive behavior.

The relationship between self-control and aggression may also be explained through cognitive-behavioral mechanisms. Effective self-control allows individuals to evaluate the consequences of their behavior before acting, whereas low self-control contributes to emotional impulsivity and reduced behavioral inhibition. Consequently, students with weaker self-control may demonstrate greater difficulty regulating anger and frustration, thereby increasing aggressive tendencies. The findings of the present study therefore highlight the critical role of self-regulatory capacities in preventing behavioral maladjustment among students.

Another major finding of the study was that callous-unemotional traits positively predicted aggression. This finding supports previous research showing that emotional insensitivity and lack of empathy are strongly associated with aggressive and antisocial behaviors (Carlson et al., 2015; Fanti, 2013). Individuals with elevated callous-unemotional traits often display diminished concern for others' emotions and reduced guilt regarding harmful actions. Such characteristics weaken moral inhibition and increase the likelihood of hostile or aggressive behavior during interpersonal interactions.

From a psychological perspective, callous-unemotional traits may impair emotional learning and empathy development, thereby reducing sensitivity to the emotional consequences of aggression. Children who are emotionally detached may perceive aggressive behavior as less morally problematic and may therefore exhibit greater willingness to engage in harmful actions. The findings of Gao and colleagues regarding the importance of emotional functioning in aggressive behavior further support this interpretation (Gao et al., 2023). Emotional deficits and reduced affective responsiveness may therefore represent central mechanisms underlying aggressive tendencies among children exposed to maltreatment.

Importantly, the present study demonstrated that callous-unemotional traits and self-control mediated the relationship between childhood maltreatment and aggression. This finding suggests that childhood maltreatment contributes to aggression not only directly but also indirectly through emotional and self-regulatory pathways. This result is highly consistent with the findings of Xie and colleagues, who reported that callous-unemotional traits and self-control mediate the association between childhood maltreatment and aggression among juvenile offenders (Xie et al., 2020). Similarly, Carlson and colleagues emphasized the combined role of emotional and personality-related factors in

explaining maladaptive behavioral outcomes among maltreated youth (Carlson et al., 2015).

The mediating role of callous-unemotional traits suggests that maltreated children may become emotionally detached and less empathic, which subsequently increases aggressive tendencies. At the same time, the mediating role of self-control indicates that childhood maltreatment weakens behavioral regulation capacities, thereby increasing impulsive and aggressive responses. These findings collectively support multidimensional models of aggression, which emphasize the interaction between emotional deficits and impaired self-regulation in the development of aggressive behavior.

The present findings also have important implications for educational and psychological interventions. Since aggression appears to be strongly associated with emotional and self-regulatory deficits, intervention programs should focus not only on behavioral management but also on emotional development, empathy enhancement, and self-control training. Previous studies have shown that cognitive-behavioral interventions and educational programs can reduce aggression and improve emotional regulation among children (Ghalamkarian & Keyhani, 2021; Rajabi et al., 2013). Moreover, moral and character education programs may strengthen empathy, ethical awareness, and interpersonal responsibility among students (Aghili et al., 2018; Marwan et al., 2025). Educational systems that emphasize emotional literacy, moral development, and social skills may therefore contribute significantly to reducing aggression and promoting healthier social adjustment.

Furthermore, the role of family and school environments in fostering emotional security and self-regulatory development should not be overlooked. Positive parent-child interactions and emotionally supportive educational settings may protect children against the negative psychological effects of maltreatment. Norouzi and colleagues emphasized the importance of cultivating moral character within educational curricula to promote ethical and emotional development among students (Norouzi et al., 2025). Such educational approaches may strengthen empathy, emotional awareness, and behavioral regulation, thereby reducing aggressive tendencies.

The findings of the present study also align with broader theoretical perspectives emphasizing the role of emotional processing and social cognition in aggression. According to social information processing theory, aggressive individuals are more likely to interpret social cues negatively and

respond impulsively or hostilely during interpersonal conflicts (Nas et al., 2005). Childhood maltreatment may intensify these maladaptive cognitive and emotional processes, increasing the likelihood of aggression. Therefore, interventions targeting emotional interpretation, empathy development, and cognitive restructuring may be particularly effective in reducing aggressive behaviors among at-risk students.

One of the limitations of the present study was the use of self-report questionnaires, which may increase the possibility of response bias and socially desirable responding. In addition, the cross-sectional design of the study limited the ability to establish causal relationships among variables. The study was also conducted only among students in Lahijan, which may limit the generalizability of the findings to other populations and cultural contexts. Another limitation was the focus on a limited number of psychological variables, while other potentially influential factors such as parenting styles, peer relationships, socioeconomic status, and school climate were not examined.

Future research is recommended to employ longitudinal designs to better examine causal relationships among childhood maltreatment, emotional traits, self-control, and aggression across developmental stages. Researchers may also investigate additional mediating and moderating variables such as attachment styles, emotional intelligence, resilience, family functioning, and peer support. Comparative studies across different cultural and educational settings could further clarify contextual influences on aggression. Moreover, future studies may benefit from using multi-method assessment approaches, including behavioral observations, clinical interviews, and teacher or parent reports.

From a practical perspective, the findings highlight the necessity of implementing preventive and intervention programs within schools and families to reduce aggression and support emotional development among children. Educational authorities should strengthen psychological counseling services and provide emotional regulation and self-control training programs for students. Parents and teachers should also receive education regarding the harmful psychological consequences of childhood maltreatment and the importance of supportive emotional communication with children. In addition, school-based programs focused on empathy training, character education, and social-emotional learning may contribute to reducing aggressive behaviors

and promoting healthier interpersonal relationships among students.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

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