

**Adverse childhood experiences and residential care environment: The mediating role of trauma-related symptoms and psychological maladjustment in adolescents**

\*Lorena Maneiro <sup>1</sup>, Nerea Llerena <sup>1</sup>, & Laura López-Romero <sup>1</sup>

<sup>1</sup> University of Santiago de Compostela, Department of Clinical Psychology and Psychobiology, Santiago de Compostela, Spain

\* Corresponding author: Lorena Maneiro

Email, [lorena.maneiro@usc.es](mailto:lorena.maneiro@usc.es), ORCID ID 0000-0002-2162-8281

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## **Abstract**

**Background:** research has consistently found poorer outcomes in adolescents who have been exposed to early interpersonal adversities, especially those in out-of-home placements. The presence of mental health problems also contributes to the perception of a more negative group climate and peer interactions through cascading effects.

**Objective:** to analyze the sequential relationships between exposure to adverse childhood experiences (ACEs), trauma-related symptoms, psychological maladjustment, and the perception of group climate and peer interactions. In addition, the study analyzes the mediating role of trauma-related symptoms and psychological maladjustment.

**Participants and Setting:** the sample comprised 161 adolescents in out-of-home care (46.6% males, 49.7% females, 3.7% non-binary), aged 12-18 ( $M = 15.22$ ,  $SD = 1.59$ ) from 25 residential facilities in Spain.

**Methods:** this study is part of the VRINEP project. Group care workers reported about ACEs and trauma-related symptoms through online questionnaires, whereas adolescents self-reported about psychological maladjustment, group climate, and peer interactions.

**Results:** differential associations between ACEs with trauma-related symptoms and internalizing problems were found. In addition, the relationship between certain ACEs and externalizing problems was fully mediated by trauma-related symptoms. Likewise, psychological maladjustment was related to a more negative perception of the group climate and peer interactions. Although trauma-related symptoms were not directly associated with the perception of the residential environment, they were indirectly associated with peer relational aggression through externalizing problems.

**Conclusions:** Mental health has a significant impact on the perception of the group climate and peer interactions among adolescents in residential care who have been exposed to ACEs.

**Keywords:** ACEs; trauma; mental health; group climate; adolescents; out-of-home care

Research on adverse childhood experiences (ACEs) and their impact on mental health has been very prolific since the ACEs study, carried out by Felitti et al. (1998). ACEs considered so far in most of studies include child maltreatment (psychological, physical, and sexual) and neglect (physical and emotional), as well as household dysfunction, including parental separation or divorce, exposure to domestic violence, living with a household member with substance abuse or mental health problems, or who had ever been in prison (see Lacey & Minnis, 2020 for a review). Although several adversities were then added to the list of ACEs, scholars agree that the impact on mental health is greater when adversities are interpersonal (e.g., child maltreatment, neglect) rather than non-interpersonal (e.g., accidents, natural disasters) (Abraham et al., 2022; Alisic et al., 2014). Importantly, the experience of multiple interpersonal adversities –often referred to as complex trauma exposure– leads to more severe and complex impairments across several areas of functioning (Cloitre et al., 2009; Felitti et al., 1998; Fischer et al., 2016; Kisiel et al., 2014).

Children and adolescents in out-of-home placements have often experienced multiple interpersonal adversities that make them more vulnerable to mental health problems and functional impairments, including attachment disorders, trauma-related symptoms, emotional and behavioral dysregulation, and placement disruptions (Clark et al., 2020; Greeson et al., 2011; Kisiel et al., 2017). The risk is even higher in children and youth who are placed in residential institutions, mainly because they are often exposed to more severe family dysfunctions and have a greater number of placement disruptions, increasing the likelihood of attachment-related difficulties and psychopathology (Fischer et al., 2016; Leloux-Opmeer et al., 2016). In residential care institutions, a positive group climate is a factor that better predict the effectiveness of interventions (Leipoldt et al., 2019). However, the perception of the group climate is

influenced by several youth factors, such as the presence of mental health problems and trauma-related symptoms, which leads to a more negative perception of the quality of relationships among group members and, in turn, to more negative outcomes (Lanctôt et al., 2016). Understanding the impact of ACEs on mental health and group climate is imperative for policies and practices to be shifted toward a trauma-informed paradigm in residential care (Sonderman et al., 2021; Tarren-Sweeney, 2008). Thus, the aim of the current study was to analyze the role of trauma-related symptoms and psychological maladjustment (i.e., internalizing and externalizing problems) in the perception of group climate and peer interactions in adolescents in residential care who have been exposed to early interpersonal adversities.

### **1.1. ACEs and Mental Health Problems**

Adverse interpersonal experiences that are chronic, repeated, and prolonged, which occur early in life and within the caregiving system, may severely impact the psychosocial development of children and youth because they entail a loss of confidence and compromise secure attachment with primary caregivers (D'Andrea et al., 2012; Fischer et al., 2016; Kisiel et al., 2017; Morelli & Villodas, 2022). Most studies have focused on the impact of a single traumatic event, such as child maltreatment, neglect, exposure to domestic violence, family criminality, or parental mental health (e.g., Ayano et al., 2021; Besemer et al., 2017; Gardner et al., 2019); however, research has shown that a high percentage of youth in residential care have been exposed to multiple interpersonal adversities (Fischer et al., 2016; Grasso et al., 2016; Lacey & Minnis, 2020; Morelli & Villodas, 2022). Exposure to multiple ACEs was found to be associated with a more complex, diverse, and severe psychopathological profile in both community samples (Abraham et al., 2022; Felitti et

al., 1998) and the child welfare system (Fischer et al., 2016; Greeson et al., 2011; Kisiel et al., 2014, 2017).

The pattern of symptoms observed in youth exposed to interpersonal adversities overlaps with those that constitute existing diagnoses, such as conduct disorder, attention deficit hyperactivity disorder (ADHD), bipolar disorder, or posttraumatic stress disorder (PTSD). However, none of these diagnoses fully capture the complete range of symptoms manifested by these youth (D’Andrea et al., 2012; Van der Kolk et al., 2005). For instance, symptoms related to insecure attachment and distorted perceptions of others are often seen in severely maltreated youth, along with emotional, behavioral, and physiological dysregulation, disturbances in attention and consciousness, interpersonal difficulties, and problems with self-esteem regulation (D’Andrea et al., 2012; Morelli & Villodas, 2022; Schmid et al., 2013; Spinazzola et al., 2021; Tarren-Sweeney, 2008). These trauma-related symptoms impact several areas of functioning through cascading effects, increasing the risk of internalizing and externalizing problems (Kisiel et al., 2017). Even though empirical support was found for the sequelae of ACEs in youth in out-of-home care, more research is needed to understand the unique effects of multiple interpersonal adversities on trauma-related symptoms and mental health problems, after controlling for the co-occurrence of other adversities (Kisiel et al., 2014).

## **1.2.Group Climate and Peer Interactions in Residential Care**

Adolescents in residential facilities who manifest problematic behavior and trauma-related symptoms are at higher risk for placement disruptions (Clark et al., 2020).

Notwithstanding, the likelihood of placement instability might be reduced provided that high-quality residential care standards are implemented, including feeling safe in the residential care center, fostering positive relationships among group members, or

investing more resources in after-care (Levrouw et al., 2020). Promoting a secure attachment and bonding to prosocial adults (e.g., group care workers) and peers are key elements to prevent placement instability and other negative outcomes (Hidalgo et al., 2016; Lanctôt et al., 2016; Sonderman et al., 2022). For youth placed in residential care, the living group is the main source of support and socialization, and creating a positive group climate is a necessary element to establish a warm and nurturing caregiving environment (Levrouw et al., 2020). A positive or open group climate is considered as a safe, respectful, and structured environment that promotes autonomy and positive youth development, where the relationships are characterized by warmth and responsiveness. On the contrary, a negative or close group climate is characterized by an authoritarian style, aggression, fear, lack of confidence, and feelings of insecurity (Strijbosch et al., 2014). A review conducted by Leipoldt et al. (2019) showed that youth who perceived the group climate as open had more positive trajectories, higher levels of treatment motivation, better coping skills, and resilience, whereas youth who perceived the group climate as negative had a worse prognosis, including more mental health problems and placement disruptions. Findings indicated that the perception of group climate is strongly dependent on the difficulties that youth experience during their period in residential care. More specifically, distressed youth with more complex and problematic profiles tend to perceive the group climate as more negative and vice versa (Lanctôt et al., 2016; Leipoldt et al., 2019).

Within a residential environment, the peer group is a key element to achieve a high-quality residential environment. Peers are important sources of influence during adolescence, and depending on the type of relationships established, they might have a positive or negative impact on youth psychosocial functioning (Cutrín et al., 2019; Giletta et al., 2021). During this developmental stage, feelings of belonging, peer

affection, and support become key factors, especially for adolescents placed in residential care, who share most of their time with other adolescents (Sonderman et al., 2022). Given that they experience similar adversities or difficulties, peers are considered important sources of emotional support and advice among youth in residential care, which are important protective factors that prevent disruptions in numerous domains of functioning (Leipoldt et al., 2019; Sonderman et al., 2021, 2022). Nevertheless, when residential environments are characterized by relational aggression and violent peer interactions, peers become a risk factor for negative outcomes (Mazzone et al., 2018; Sekol, 2013). Prior research suggests that this association might be influenced by complex and problematic mental health problems displayed by youth, with those manifesting more problems being at higher risk for peer aggression and less peer acceptance (Mazzone et al., 2018; Sonderman et al., 2021).

### **1.3.The Current Study**

A wide range of studies have tried to disentangle the role of interpersonal ACEs on mental health problems in vulnerable populations. However, a vast majority has focused on a single interpersonal experience (child maltreatment in most of the cases) or using a cumulative score of exposure to multiple adversities, but fewer studies have attempted to disentangle specific patterns of co-occurrence accounting for the effect of other adversities (Cloitre et al., 2009; Grasso et al., 2016). Furthermore, studies with samples of adolescents placed in residential care often include adolescents under the jurisdiction of the child welfare and juvenile justice systems, but not specifically in out-of-home placements (Fischer et al., 2016; Van Vugt et al., 2014). Adolescents involved in the Child Protection System (CPS) have specific needs and profiles distinct from those involved in other residential settings, not only in terms of youth characteristics but also residential environment and group climate (del Valle et al., 2013). Considering all

the aforementioned factors, the main goal of the current study is to analyze the sequential relationships between a set of interpersonal ACEs, trauma-related symptoms, psychological maladjustment (i.e., internalizing and externalizing problems), and the perception of group climate and peer interactions in adolescents in residential care. In addition, we aimed to analyze the mediating role of trauma-related symptoms and psychological maladjustment. The results will shed light on the effects of ACEs on youths' mental health, which allow group care workers to identify and address specific needs in youth that contribute to their wellbeing, making them feel safe and accepted in the group.

## **2. Method**

### **2.1. Participants and Procedure**

Data used in the current study were collected in the first wave of the VRINEP project (Risk and Needs Assessment in the Child Protection System), a longitudinal study aimed to understand the risk profiles and developmental trajectories in adolescents in out-of-home care, their precursors, and outcomes. A total of 25 residential facilities located in Galicia (NW Spain) participated in the study, including family group homes ( $n = 13$ ), residential care centers ( $n = 4$ ), centers with independent housing units ( $n = 5$ ), therapeutic residential care center ( $n = 2$ ), and other ( $n = 1$ ). These out-of-home placements are intended for children and adolescents who cannot remain in their own families for several reasons. In this sample, the main cause for the current child protection measure was abandonment/neglect (22.4%), followed by child's severe behavior problems (15.5%), impossibility of fulfilling parental functions (e.g., illness, incarceration) (12.4%), risk to life, health, or physical integrity (e.g., physical maltreatment) (8.1%), risk to moral and psychological integrity (e.g., psychological or emotional maltreatment) (4.3%), inducement into prostitution, mendicity, or



delinquency (0.6%), other causes (21.7%). The sample used in the current analyses comprised 161 adolescents (46.6% males, 49.7% females, 3.7% non-binary), aged 12-18 ( $M = 15.22$ ,  $SD = 1.59$ ).

This study was approved by the Ethics Review Boards of the corresponding universities. The research proposal was presented to the regional Ministry of Social Policy and the CPS department. Upon their approval, 31 residential care centers and child protection agencies were initially approached by phone and information letters were sent by mail, including the objectives and a brief explanation of the project methodology. In addition, group care workers were invited to participate in an online meeting to provide them with more detailed information about the project and to solve any doubts and questions. After sending all the information, 25 residential facilities agreed to participate in the VRINEP project. Group care workers were asked to explain the project to adolescents and request their collaboration. All adolescents in residential facilities were invited to participate, excluding those who did not speak Spanish or with intellectual disabilities that could hamper their understanding of their own situation in the residential facility. Participation was voluntary, and only those group care workers and adolescents who voluntarily agreed to participate were included in the study. Active informed consent of the legal responsible(s) of adolescents younger than 14 years was requested. Eventually, all adolescents provided informed assent to participate after reading the information about the study. The information was collected through online questionnaires and confidentially ensured the process. The first wave of data collection was carried out between May and June 2022, and a drawing of five smartwatches was held among all the adolescents that filled out the questionnaires.

## **2.2. Variables and Measures**

**Child maltreatment and neglect.** Group care workers provided information about child maltreatment and neglect by the Child Maltreatment Severity questionnaire (MSQ; Calheiros et al., 2021). The questionnaire comprises 18 items to assess the severity of specific maltreatment subtype practices: physical and psychological abuse (4 items; e.g., “aggressive verbal interaction”,  $\alpha = .83$ ); physical neglect (8 items; e.g., “physical hygiene and well-being”,  $\alpha = .86$ ); and psychological neglect (6 items; e.g., “relationship with attachment figures”,  $\alpha = .79$ ). Each item is responded in relation to four descriptors of severity and includes another response option in case any descriptions have occurred. Item responses ranged from 1 (*Unknown/None of the severity descriptions has occurred*) to 5 (*extremely severe*).

**Household dysfunction.** The Adverse Childhood Experiences International Questionnaire (ACE-IQ, World Health Organization, 2018) was used for the assessment of several factors related to household dysfunction. Specifically, group care workers reported about the youths’ family substance use (did he/she live with a household member who was a problem drinker or alcoholic, or misused street or prescription drugs?); family mental health problems (did he/she live with a household member who was depressed, mentally ill or suicidal?); family criminality (did he/she live with a household member who was ever sent to jail or prison?); and exposure to domestic violence (3 items; e.g., “did he/she see or hear a parent or household member in his/her home being yelled at, screamed at, sworn at, insulted or humiliated?”,  $\alpha = .92$ ). Household problems related to substance use, mental health, and criminality were responded using a no/yes format, whereas exposure to domestic violence items were rated using a four-point scale from 0 (*never*) to 3 (*often*).

**Trauma-related symptoms.** Group care workers reported trauma-related symptoms using the Spanish Assessment Checklist for Adolescents-Short Form (ACA-

SF, Tarren-Sweeney, 2013). This instrument was designed to measure mental health difficulties that are often observed in adolescents exposed to early interpersonal adversities. The original ACA-SF is composed of 37 items, grouped into six factors: non-reciprocal behaviors (6 items; e.g., “does not show affection”), social instability (8 items; e.g., “too friendly with strangers”), emotional dysregulation/distorted social cognition (7 items: e.g., “intense reaction to criticism”), dissociation/trauma symptoms (6 items; e.g., “can’t tell if an experience is real or a dream”), food maintenance (5 items; e.g., “hides or stores food”), and sexual behavior (5 items; e.g., “forces or pressures other youth or children into sexual acts”). Each item is rated using a three-point scale from 0 (*not true/did not occur*) to 2 (*mostly true/occurred more than once*). For the purposes of the current study, the composite score of trauma-related symptoms was used ( $\alpha = .85$ ).

**Psychological maladjustment.** Adolescents self-reported on internalizing and externalizing problems using the Spanish version of the Social Skills Improvement System (SSIS, Gresham & Elliot, 2008). The subscales of internalizing (10 items; e.g., “I am afraid of many things”,  $\alpha = .86$ ) and externalizing problems (12 items; e.g., “I get into fights with others”,  $\alpha = .87$ ) were used in the current study. Frequency of behavior problems was assessed using a four-point rating scale ranging from 0 (*never*) to 3 (*almost always*).

**Group climate.** The perception of group climate was self-reported by adolescents using a Spanish adaptation of the Group Climate Instrument for Children (GCIC, Strijbosch et al., 2014). This scale is composed of 14 items rated from 1 (*totally disagree*) to 5 (*totally agree*), intended to assess the perception of open group climate (9 items; e.g., “I trust the group workers”,  $\alpha = .94$ ) and close group climate (5 items; e.g., “The chaos in this group drives me crazy”,  $\alpha = .56$ ). Open group climate refers to the

perception of the quality of relationships with group care workers based on honesty, trust, and confidence. On the other hand, a close group climate refers to the perception of chaos in the group and distrust relationships with group care workers.

**Interactions with peers.** Adolescents self-reported about their relationship with other adolescents in the group through a Spanish adaptation of the Peer Interactions in Residential Youth Care (PIRY) Questionnaire (Sonderman et al., 2022). This questionnaire is composed of 15 items that assess peer support and acceptance (5 items; e.g., “other youth try to help me with problems”,  $\alpha = .81$ ) and relational aggression (10 items; e.g., “youth threaten each other here”,  $\alpha = .88$ ). The item response ranged from 1 (*totally disagree*) to 5 (*totally agree*).

### **2.3. Data Analysis**

Firstly, SPSS v. 28 was used to analyze descriptive statistics and gender differences through one-way analysis of variance (ANOVA), as well as to examine zero-order correlations among all the study variables. Secondly, Mplus 7.4 (Muthén & Muthén, 2011) was used to conduct a path analysis in order to examine the associations of ACEs (i.e., child abuse, neglect and household dysfunction) on psychological maladjustment (i.e., trauma-related symptoms, internalizing, and externalizing problems) and residential group climate (i.e., peer relational aggression, peer acceptance, open and close group climate). The model included ACEs as exogenous variables and their relationship with trauma-related symptoms, internalizing and externalizing problems. Trauma-related symptoms were also included as a predictor of internalizing and externalizing problems, and residential group climate. Moreover, internalizing and externalizing problems were included as predictors of residential group climate. Finally, mediating effects were considered. Specifically, the indirect effect of trauma-related symptoms on the association between ACEs and internalizing

and externalizing problems was analyzed, as well as the indirect effect of internalizing and externalizing problems on the relationship between trauma-related symptoms and residential group climate variables.

The model was estimated using maximum likelihood (ML). Model fit was assessed using the root mean square error of approximation (RMSEA), standardized root mean squared residual (SRMR), comparative fit index (CFI) and the Tucker-Lewis index (TLI). According to Hu and Bentler (1999), RMSEA value lower than 0.05, SRMR lower than 0.06 and TLI and CFI higher than 0.95 were considered indicators of a good model fit, whereas RMSEA and SRMR values smaller than 0.08, and TLI and CFI larger than 0.90 indicated an adequate model fit. Regarding mediation analysis, bootstrapping was used and the 95% confidence intervals for the standardized indirect effects were obtained with 10,000 bootstrap resamples.

### **3. Results**

#### **3.1. Descriptive Statistics and Zero-order Correlations**

Descriptive statistics and gender differences among all the study variables are displayed in Table 1. The differences between groups (i.e., males, females and non-binary) were significant with regard to psychological neglect, trauma-related symptoms and internalizing problems. In these variables, the highest scores were found in the group of adolescents identified as non-binary, followed by females. In addition, peer acceptance showed significant differences between groups, but in this case, girls obtained the highest scores, followed by the non-binary group.

Zero-order correlations among all study variables are presented in Table 2. ACEs were found to be significantly related to each other, with some variations depending on the type of adversity. Specifically, adversities related to household dysfunction were highly correlated, whilst child abuse was associated with neglect (both

physical and psychological) and to a lesser extent with household dysfunction.

Secondly, internalizing and externalizing problems were significantly associated with all residential group climate variables, except with peer acceptance. Additionally, peer aggression was positively related to higher levels of household dysfunction, particularly family substance abuse, family mental health problems, and family criminality. The perception of a close group climate was also associated with family substance abuse and family mental health problems, as well as with less trauma-related symptoms.

### **3.2. Path Analysis Model Including ACEs, Trauma-related Symptoms, Psychological Maladjustment, and Residential Care Environment**

Figure 1 shows the results of the path analysis model to test the effect of ACEs on trauma-related symptoms and psychological maladjustment, and their effects on residential climate group. Given that significant differences were found among males, females and non-binary youth in some of the study variables but the sample was too small to conduct multiple group analysis, gender was included in the model as a covariate. The first hypothesized model did not fit well ( $\chi^2=324.99$   $p<.001$ ; CFI=.90; TLI=.77; RMSEA=.08 SRMR=.06). Modification indices indicated that including a new parameter specifying the relationship between internalizing and externalizing problems would increase the model fit. After the inclusion of this parameter, the hypothesized model obtained a good model fit ( $\chi^2=38.71$   $p=.19$ ; CFI=.97; TLI=.93; RMSEA=.04; SRMR=.05).

After controlling for all the variables in the model, family substance use, and psychological neglect showed a positive direct association with trauma-related symptoms. Family mental health was positively related with internalizing problems and physical neglect had a negative direct effect on psychological maladjustment. Regarding trauma-related symptoms, a positive direct effect on externalizing problems was

observed. Lastly, significant direct effects from externalizing and internalizing problems to the perception of the group climate and peer interactions were observed. Particularly, associations between internalizing problems and three of the variables related to residential context, namely peer relational aggression, open group climate and close group climate were found, whereas a positive effect from externalizing problems to peer relational aggression appeared. Gender showed a positive direct effect with trauma-related symptoms and internalizing problems.

### **3.3. Indirect effects**

The results of the two mediating models are displayed in Table 3. Regarding the mediation model which examined the potential indirect effect of trauma-related symptoms on the relationship between ACEs and externalizing problems, results showed that the association between family substance use and psychological neglect with externalizing problems was fully mediated by trauma-related symptoms. With regards to the model that tested the indirect effect of psychological maladjustment on the relationship between trauma-related symptoms and residential group climate, an indirect effect of externalizing problems on the relationship with peer aggression was found.

## **4. Discussion**

This study aimed to understand the sequential relationships of ACEs, trauma-related symptoms, psychological maladjustment, and the perception of group climate and peer interactions in a sample of adolescents in residential care. Priority attention was given to the mediating role of trauma-related symptoms and psychological maladjustment (i.e., internalizing and externalizing problems) in these relationships. The results showed differential associations of several interpersonal adversities with trauma-related symptoms and internalizing problems. Interestingly, trauma-related

symptoms were directly related to externalizing but not to internalizing problems. Regarding the perception of group climate, these findings evidenced that higher levels of externalizing problems were associated with more peer relational aggression, whereas internalizing problems were positively associated not only with peer aggression but also with a more negative perception of the group climate. Finally, significant mediations were found. In particular, the relationship between exposure to interpersonal adversities (i.e., psychological neglect and having a household member with substance use problems) and externalizing problems was fully mediated by the presence of trauma-related symptoms. Similarly, the relationship between trauma-related symptoms and peer relational aggression was fully mediated by externalizing problems.

As expected, the experience of early adversities has a detrimental effect on mental health in adolescents (Alisic et al., 2014; García et al., 2017). However, the current results indicate that not all interpersonal adversities have the same effect on mental health, but they differentially impact several areas of functioning. This result is in line with previous studies that found differential effects of ACEs on mental health problems (Kisiel et al., 2014; Nurius et al., 2012). Despite the results differ among studies, they found overall unique effects of child maltreatment, including physical and emotional and caregiver mental illness, on future mental health problems after controlling for other ACEs (Nurius et al., 2012; van Duin et al., 2019; van Vugt et al., 2014). A recent meta-analysis showed that all ACEs assessed in this study were associated with a higher risk of depression, although the highest scores were found for emotional abuse and household substance use (Tan & Mao, 2023). It should be noted that most studies were conducted with adult samples and using retrospective designs, which might not fully resemble the results found in samples of adolescents in out-of-home placements. The few studies using samples of children and adolescents involved



in the Child Welfare System further support the effect of child maltreatment on psychosocial impairments (Brown et al., 2019; García et al., 2017; McGee et al., 1997). Literature has consistently shown that both child maltreatment and neglect may trigger impairments in several areas of functioning (Zeanah & Humphreys, 2018); however, their impact in combination with other interpersonal adversities has barely been studied. Our results do not support the role of physical and emotional abuse as the key interpersonal adversities that lead to more harmful outcomes but instead neglect and the presence of substance abuse and mental health problems in the household of origin were strongly associated with trauma-related symptoms and psychological maladjustment. This result is partially in line with the study of van Vugt et al. (2014) using a sample of girls in residential care, which found a strong effect of emotional neglect. Considering neglect is often the most common interpersonal adverse experience in adolescents in residential care, more efforts should be made to mitigate the risk of negative outcomes in neglected adolescents.

Regarding the impact of interpersonal adversities on mental health, the current findings evidence differential relationships with trauma-related symptoms and internalizing problems. Family substance use and psychological neglect were directly associated with trauma-related symptoms, whereas the presence of mental health problems in the household and physical neglect were directly associated with internalizing problems. Despite trauma-related symptoms and internalizing problems were significantly correlated with each other at a bivariate level, this relationship became nonsignificant when all variables were entered in the path analysis model. Altogether, these results provide evidence for a pattern of trauma-related symptoms that are not captured by traditional assessments of internalizing problems, and which is in line with the conceptualization of Developmental Trauma Disorder as a distinct

syndrome in adolescents exposed to interpersonal adversities (Schmid et al., 2013; Spinazzola et al., 2021; van der Kolk et al., 2005). The fact that trauma-related symptoms were strongly related to psychological neglect is in line with expectations because psychological neglect entails a lack of attachment bonding with primary caregivers, which affects the ability of the individual to self-regulate and interact with others (D'Andrea et al., 2012). On the other hand, the direct relationship found between mental health issues in the family of origin and internalizing problems supports the hypothesis of the intergenerational transmission of internalizing mental health problems (e.g., Pettit et al., 2008). Nevertheless, this result could also indicate that youths who have had to deal with family mental health issues are more aware of the symptoms of anxiety or depression and, therefore, they are able to identify these symptoms in themselves, which might be translated into higher scores on internalizing scales (McGee et al., 1997). Unexpectedly, physical neglect was negatively related to internalizing problems. According to García et al. (2017), one potential explanation could be that neglected children are more often referred to mental health services to address their internalizing problems and thus the results might be masked by other variables that were not considered in this study, such as psychological interventions or therapies.

Interestingly, no direct associations were found between ACEs and externalizing problems, but all the associations were fully mediated by trauma-related symptoms. These results have two main implications. First, the range of difficulties displayed by adolescents in residential care who have been exposed to early interpersonal adversities goes far beyond behavioral problems that are assessed through traditional psychosocial functioning scales (Goemans et al., 2018; Tarren-Sweeney, 2013). This pattern of dysregulation is characterized by lack of self-control, emotion dysregulation, cognition deficits, dissociation, problems with interpersonal relationships, and attribution bias

(D'Andrea et al., 2012; van der Kolk et al., 2005). Second, externalizing problems in this population are a complex phenomenon that seems to be influenced by underlying trauma mechanisms (Morelli & Villodas, 2022). This result contributes to making professionals more aware of the actual mechanisms that lead to problematic behavior in adolescents, which should be targeted in early interventions (Lacey & Minnis, 2020). Thus, neglecting the presence of trauma-related symptoms may entail an inaccurate assessment of the needs of adolescents in residential care and, therefore, a reduction in the allocation of resources for trauma-informed interventions (Frogley et al., 2019).

One of the main aims of this study was to understand the relationship between adolescents' mental health and their perception of group climate and peer interactions. In this regard, results show that adolescents who score higher in internalizing problems tend to perceive more peer relational aggression and a closer group climate, as well as a less open group environment. In addition, adolescents with higher levels of externalizing problems also perceive more peer relational aggression. It is noteworthy that although trauma-related symptoms were not directly related to the perception of group climate or peer interactions, they were indirectly related to peer relational aggression through externalizing problems. Overall, these results indicate that early adversities contribute to poorer outcomes through cascading effects and highlight the need to address psychosocial maladjustment as soon as possible (DeKlyen & Greenberg, 2016; Kisiel et al., 2017; Leipoldt et al., 2019). Considering the impact that a positive residential environment has on adolescents' development, more efforts should be invested in creating an open and collaborative group climate that enhances positive interactions with peers and group care workers (Lanctôt et al., 2016; Levrouw et al., 2020; Sonderman et al., 2022). To that end, particular attention needs to be paid to potential underlying mechanisms that might prevent youth from feeling safe and

accepted in the group, such as psychological maladjustment (Leipoldt et al., 2019; Sonderman et al., 2021). The shift toward a trauma-informed paradigm in residential care must also integrate the principles of living in a positive group environment in order to promote adolescents' wellbeing (James, 2011; Sonderman et al., 2021).

#### **4.1.Limitations and Future Directions**

This study is not exempted from limitations that must be considered when interpreting the results. First, a cross-sectional design was used for data analysis. Despite the current results contribute to understanding the needs of adolescents in residential care, we fail to mention that the directionality of the relationships in our model was proposed based exclusively on theory. Future longitudinal studies must replicate these analyses to understand the direction of the effects, with a special focus on bidirectional and mediation effects. Second, the sample size used in this study was relatively small and included only adolescents in residential care. Although this sample can provide a valuable source of information about this very specific population, we acknowledge that the results cannot be generalized to adolescents in other out-of-home care placements, such as those in foster care or kinship care. Larger sample sizes that include adolescents in different out-of-home settings should be considered in future research. In the same line, although no gender differences were found in most of the study variables, it is possible that some gender differences could emerge in the path analysis model if the sample size was larger. Thus, gender differences must also be considered in future studies. Finally, despite one of the strengths of this study was the use of multiple informants, any of the variables was reported by both group care workers and adolescents, which might partially affect the results. It would be interesting to analyze in the future the agreement between different informants and how the results may be interpreted accordingly.

## References

- Abraham, E. H., Antl, S. M., & McAuley, T. (2022). Trauma exposure and mental health in a community sample of children and youth. *Psychological Trauma: Theory, Research, Practice, and Policy*, 14, 624–632.  
<https://doi.org/10.1037/tra0001035>
- Alisic, E., Zalta, A. K., Van Wesel, F., Larsen, S. E., Hafstad, G. S., Hassanpour, K., & Smid, G. E. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: meta-analysis. *The British Journal of Psychiatry*, 204(5), 335–340. <https://doi.org/10.1192/bjp.bp.113.131227>
- Ayano, G., Betts, K., Maravilla, J. C., & Alati, R. (2021). A systematic review and meta-analysis of the risk of disruptive behavioral disorders in the offspring of parents with severe psychiatric disorders. *Child Psychiatry & Human Development*, 52(1), 77–95. <https://doi.org/10.1007/s10578-020-00989-4>
- Besemer, S., Ahmad, S. I., Hinshaw, S. P., & Farrington, D. P. (2017). A systematic review and meta-analysis of the intergenerational transmission of criminal behavior. *Aggression and Violent Behavior*, 37, 161–178.  
<https://doi.org/10.1016/j.avb.2017.10.004>
- Brown, S. M., Bender, K., Orsi, R., McCrae, J. S., Phillips, J. D., & Rienks, S. (2019). Adverse childhood experiences and their relationship to complex health profiles among child welfare-involved children: A classification and regression tree analysis. *Health Services Research*, 54, 902–911. <https://doi.org/10.1111/1475-6773.13166>
- Calheiros, M. M., Silva, C. S., & Magalhães, E. (2021). Child Maltreatment Severity Questionnaire (MSQ) for professionals: Development, validity, and reliability

evidence. *Assessment*, 28(5), 1397–1417.

<https://doi.org/10.1177/1073191119890030>

Clark, S. L., Palmer, A. N., Akin, B. A., Dunkerley, S., & Brook, J. (2020).

Investigating the relationship between trauma symptoms and placement instability. *Child Abuse & Neglect*, 108, 104660.

<https://doi.org/10.1016/j.chiabu.2020.104660>

Cloitre, M., Stolbach, B. C., Herman, J. L., Kolk, B. V. D., Pynoos, R., Wang, J., &

Petkova, E. (2009). A developmental approach to complex PTSD: Childhood and adult cumulative trauma as predictors of symptom complexity. *Journal of Traumatic Stress*, 22, 399–408. <https://doi.org/10.1002/jts.20444>

Cutrín, O., Maneiro, L., Sobral, J., & Gómez-Fraguela, J. A. (2019). Validation of the

deviant peers scale in Spanish adolescents: A new measure to assess antisocial behaviour in peers. *Journal of Psychopathology and Behavioral Assessment*, 41(2), 185–197. <https://doi.org/10.1007/s10862-018-9710-6>

D’Andrea, W., Ford, J., Stolbach, B., Spinazzola, J., & Van der Kolk, B. A. (2012).

Understanding interpersonal trauma in children: why we need a developmentally appropriate trauma diagnosis. *American Journal of Orthopsychiatry*, 82(2), 187–200. <https://doi.org/10.1111/j.1939-0025.2012.01154.x>

DeKlyen, M., & Greenberg, M. T. (2016). Attachment and psychopathology in

childhood In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 639–666). New York, NY: Guilford.

del Valle, J. F., Canali, C., Bravo, A., & Vecchiato, T. (2013). Child protection in Italy

and Spain: Influence of the family supported society. *Psychosocial Intervention*, 22(3), 227–237. <https://doi.org/10.5093/in2013a26>

- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine*, 14(4), 245–258. [https://doi.org/10.1016/S0749-3797\(98\)00017-8](https://doi.org/10.1016/S0749-3797(98)00017-8)
- Fischer, S., Dölitzsch, C., Schmeck, K., Fegert, J. M., & Schmid, M. (2016). Interpersonal trauma and associated psychopathology in girls and boys living in residential care. *Children and Youth Services Review*, 67, 203–211. <https://doi.org/10.1016/j.chilyouth.2016.06.013>
- Frogley, C., John, M., Denton, R., & Querstret, D. (2019). ‘They don’t meet the stereotypes in the boxes...’: Foster carers’ and clinicians’ views on the utility of psychometric tools in the mental health assessment of looked after children. *Adoption & Fostering*, 43, 119–136. <https://doi.org/10.1177/0308575919841752>
- García, A. R., Gupta, M., Greeson, J. K., Thompson, A., & DeNard, C. (2017). Adverse childhood experiences among youth reported to child welfare: Results from the national survey of child & adolescent wellbeing. *Child Abuse & Neglect*, 70, 292–302. <https://doi.org/10.1016/j.chiabu.2017.06.019>
- Gardner, M. J., Thomas, H. J., & Erskine, H. E. (2019). The association between five forms of child maltreatment and depressive and anxiety disorders: A systematic review and meta-analysis. *Child Abuse & Neglect*, 96, 104082. <https://doi.org/10.1016/j.chiabu.2019.104082>
- Giletta, M., Choukas-Bradley, S., Maes, M., Linthicum, K. P., Card, N. A., & Prinstein, M. J. (2021). A meta-analysis of longitudinal peer influence effects in childhood and adolescence. *Psychological Bulletin*, 147(7), 719–747. <https://doi.org/10.1037/bul0000329>

- Goemans, A., Tarren-Sweeney, M., van Geel, M., & Vedder, P. (2018). Psychosocial screening and monitoring for children in foster care: Psychometric properties of the Brief Assessment Checklist in a Dutch population study. *Clinical Child Psychology and Psychiatry*, 23, 9–24.  
<https://doi.org/10.1177/1359104517706527>
- Grasso, D. J., Dierkhising, C. B., Branson, C. E., Ford, J. D., & Lee, R. (2016). Developmental patterns of adverse childhood experiences and current symptoms and impairment in youth referred for trauma-specific services. *Journal of Abnormal Child Psychology*, 44(5), 871–886. <https://doi.org/10.1007/s10802-015-0086-8>
- Greeson, J. K., Briggs, E. C., Kisiel, C. L., Layne, C. M., Ake, G. S., Ko, S. J., Gerrity, E.T., Steinberg, A.M., Howard, M.L., Pynoos, R.S., & Fairbank, J. A. (2011). Complex trauma and mental health in children and adolescents placed in foster care. *Child Welfare*, 90, 91–108.
- Gresham, F.M., Elliot, S.N. (2008). Social Skills Improvement System (SSIS). USA. MN: Pearson.
- Hidalgo, J., Maravić, M. C., Milet, R. C., & Beck, J. C. (2016). Promoting collaborative relationships in residential care of vulnerable and traumatized youth: A playfulness approach integrated with trauma systems therapy. *Journal of Child & Adolescent Trauma*, 9(1), 17–28. <https://doi.org/10.1007/s40653-015-0076-6>
- James, S. (2011). What works in group care? A structured review of treatment models for group homes and residential care. *Children and Youth Services Review*, 33, 308–321. <https://doi.org/10.1016/j.childyouth.2010.09.014>
- Kisiel, C. L., Fehrenbach, T., Torgersen, E., Stolbach, B., McClelland, G., Griffin, G., & Burkman, K. (2014). Constellations of interpersonal trauma and symptoms in



- child welfare: Implications for a developmental trauma framework. *Journal of Family Violence*, 29(1), 1–14. <https://doi.org/10.1007/s10896-013-9559-0>
- Kisiel, C., Summersett-Ringgold, F., Weil, L. E., & McClelland, G. (2017). Understanding strengths in relation to complex trauma and mental health symptoms within child welfare. *Journal of Child and Family Studies*, 26(2), 437–451. <https://doi.org/10.1007/s10826-016-0569-4>
- Lacey, R. E., & Minnis, H. (2020). Practitioner review: twenty years of research with adverse childhood experience scores—advantages, disadvantages and applications to practice. *Journal of Child Psychology and Psychiatry*, 61(2), 116–130. <https://doi.org/10.1111/jcpp.13135>
- Lanctôt, N., Lemieux, A., & Mathys, C. (2016). The value of a safe, connected social climate for adolescent girls in residential care. *Residential Treatment for Children & Youth*, 33(3-4), 247–269. <https://doi.org/10.1080/0886571X.2016.1207218>
- Leipoldt, J. D., Harder, A. T., Kaye, N. S., Grietens, H., & Rimehaug, T. (2019). Determinants and outcomes of social climate in therapeutic residential youth care: A systematic review. *Children and Youth Services Review*, 99, 429–440. <https://doi.org/10.1016/j.childyouth.2019.02.010>
- Leloux-Opmeer, H., Kuiper, C., Swaab, H., & Scholte, E. (2016). Characteristics of children in foster care, family-style group care, and residential care: A scoping review. *Journal of Child and Family Studies*, 25, 2357–2371. <https://doi.org/10.1007/s10826-016-0418-5>
- Levrouw, D., Devlieghere, J., Vandeveld, S., & Roose, R. (2020). Developing a positive living climate in residential youth care: a qualitative study. *Children*

*and Youth Services Review, 116*, 105221.

<https://doi.org/10.1016/j.chidyouth.2020.105221>

Mazzone, A., Nocentini, A., & Menesini, E. (2018). Bullying and peer violence among children and adolescents in residential care settings: A review of the literature. *Aggression and Violent Behavior, 38*, 101–112.

<https://doi.org/10.1016/j.avb.2017.12.004>

McGee, R. A., Wolfe, D. A., & Wilson, S. K. (1997). Multiple maltreatment experiences and adolescent behavior problems: Adolescents' perspectives. *Development and Psychopathology, 9*, 131–149.

<https://doi.org/10.1017/S0954579497001107>

Morelli, N. M., & Villodas, M. T. (2022). A systematic review of the validity, reliability, and clinical utility of Developmental Trauma Disorder (DTD) symptom criteria. *Clinical Child and Family Psychology Review, 25*(2), 376–394. <https://doi.org/10.1007/s10567-021-00374-0>

Muthén, L. K., & Muthén, B. O. (2011). Mplus user's guide (7th ed.). Muthén & Muthén.

Nurius, P. S., Logan-Greene, P., & Green, S. (2012). ACEs within a social disadvantage framework: Distinguishing unique, cumulative, and moderated contributions to adult mental health. *Journal of Prevention & Intervention in the Community, 40*(4), 278–290. <https://doi.org/10.1080/10852352.2012.707443>

Pettit, J. W., Olino, T. M., Roberts, R. E., Seeley, J. R., & Lewinsohn, P. M. (2008). Intergenerational transmission of internalizing problems: Effects of parental and grandparental major depressive disorder on child behavior. *Journal of Clinical Child & Adolescent Psychology, 37*, 640–650.

<https://doi.org/10.1080/15374410802148129>

- Schmid, M., Petermann, F., & Fegert, J. M. (2013). Developmental trauma disorder: pros and cons of including formal criteria in the psychiatric diagnostic systems. *BMC Psychiatry*, 13(1), 1–12. <https://doi.org/10.1186/1471-244X-13-3>
- Sekol, I. (2013). Peer violence in adolescent residential care: A qualitative examination of contextual and peer factors. *Children and Youth Services Review*, 35(12), 1901–1912. <https://doi.org/10.1016/j.chidyouth.2013.09.006>
- Sonderman, J., Bekken, F. F., Van der Helm, G. H. P., Roest, J. J., Kuiper, C. H. Z., Stams, G. J. J. M., & Van de Mheen, D. (2022). Peer interactions in residential youth care: A validation study of the Peer Interactions in Residential Youth Care (PIRY) Questionnaire. *Residential Treatment for Children & Youth*, 39(3), 239–260. <https://doi.org/10.1080/0886571X.2020.1787924>
- Sonderman, J., Van der Helm, G. H. P., Kuiper, C. H. Z., Roest, J. J., Van de Mheen, D., & Stams, G. J. J. M. (2021). Differences between boys and girls in perceived group climate in residential youth care. *Children and Youth Services Review*, 120, 105628. <https://doi.org/10.1016/j.chidyouth.2020.105628>
- Spinazzola, J., Van der Kolk, B., & Ford, J. D. (2021). Developmental trauma disorder: A legacy of attachment trauma in victimized children. *Journal of Traumatic Stress*, 34(4), 711–720. <https://doi.org/10.1002/jts.22697>
- Strijbosch, E. L. L., Helm, G. V. D., Brandenburg, M. V., Mecking, M., Wissink, I. B., & Stams, G. J. J. M. (2014). Children in residential care: Development and validation of a group climate instrument. *Research on Social Work Practice*, 24(4), 462–469. <https://doi.org/10.1177/1049731513510045>
- Tan, M., & Mao, P. (2023). Type and dose-response effect of adverse childhood experiences in predicting depression: A systematic review and meta-analysis.

*Child Abuse & Neglect*, 139, 106091.

<https://doi.org/10.1016/j.chiabu.2023.106091>

Tarren-Sweeney, M. (2008). The mental health of children in out-of-home care. *Current Opinion in Psychiatry*, 21(4), 345–349.

<https://doi.org/10.1097/YCO.0b013e32830321fa>

Tarren-Sweeney, M. (2013). The Assessment Checklist for Adolescents–ACA: A scale for measuring the mental health of young people in foster, kinship, residential and adoptive care. *Children and Youth Services Review*, 35, 348–393.

<https://doi.org/10.1016/j.chilyouth.2012.12.005>

Van der Kolk, B. A., Roth, S., Pelcovitz, D., Sunday, S., & Spinazzola, J. (2005). Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. *Journal of Traumatic Stress*, 18(5), 389–399.

<https://doi.org/10.1002/jts.20047>

van Duin, L., Bevaart, F., Zijlmans, J., Luijckx, M. J. A., Doreleijers, T. A., Wierdsma, A. I., Oldehinkel, A.J., Marhe, R., & Popma, A. (2019). The role of adverse childhood experiences and mental health care use in psychological dysfunction of male multi-problem young adults. *European Child & Adolescent Psychiatry*, 28, 1065–1078. <https://doi.org/10.1007/s00787-018-1263-4>

Van Vugt, E., Lanctôt, N., Paquette, G., Collin-Vézina, D., & Lemieux, A. (2014). Girls in residential care: From child maltreatment to trauma-related symptoms in emerging adulthood. *Child Abuse & Neglect*, 38(1), 114–122.

<https://doi.org/10.1016/j.chiabu.2013.10.015>

World Health Organization (2018). Adverse Childhood Experiences International Questionnaire. In *Adverse Childhood Experiences International Questionnaire*

(ACE-IQ). Geneva: WHO. [https://www.who.int/publications/m/item/adverse-childhood-experiences-international-questionnaire-\(ace-iq\)](https://www.who.int/publications/m/item/adverse-childhood-experiences-international-questionnaire-(ace-iq))

Zeanah, C. H., & Humphreys, K. L. (2018). Child abuse and neglect. *Journal of the American Academy of Child & Adolescent Psychiatry*, 57, 637–644.  
<https://doi.org/10.1016/j.jaac.2018.06.007>

Table 1. Descriptive Statistics and Gender Differences among all the Study Variables

	Range	Total sample <i>M (SD)</i>	Boys <i>M (SD)</i>	Girls <i>M (SD)</i>	Non-binary <i>M (SD)</i>	<i>F</i>
Family substance use	0-1	0.58 (0.50)	0.62 (0.49)	0.55 (0.50)	0.50 (0.58)	0.44
Family mental health	0-1	0.56 (0.50)	0.53 (0.51)	0.57 (0.50)	1.00 (0.00)	1.71
Family criminality	0-1	0.24 (0.43)	0.28 (0.45)	0.20 (0.40)	0.25 (0.50)	0.63
EFV	0-3	1.29 (1.16)	1.34 (1.20)	1.22 (1.39)	1.67 (0.82)	0.40
Phys./psychol. abuse	1-4	1.52 (0.77)	1.45 (0.69)	1.58 (0.83)	1.81 (0.90)	0.72
Physical neglect	1-4	1.49 (0.69)	1.39 (0.62)	1.61 (0.67)	1.31 (0.31)	1.70
Psychological neglect	1-3.83	1.79 (0.77)	1.62 (0.68)	1.96 (0.84)	1.98 (0.49)	3.37*
Trauma symptoms	0-1.22	0.48 (0.27)	0.43 (0.25)	0.51 (0.25)	0.84 (0.41)	5.63**
Externalizing	0.08-2.92	1.24 (0.61)	1.20 (0.57)	1.27 (0.59)	1.42 (1.06)	0.46
Internalizing	0.10-3.10	1.47 (0.68)	1.16 (0.55)	1.67 (0.68)	2.48 (0.53)	19.21***
Peer aggression	1-5	3.05 (0.87)	3.08 (0.99)	3.00 (0.73)	3.38 (1.12)	0.59
Peer acceptance	1-5	3.51 (0.96)	3.29 (0.97)	3.78 (0.84)	3.00 (1.45)	5.30**
Open group climate	1-5	3.72 (0.91)	3.78 (0.91)	3.71 (0.89)	3.20 (1.19)	1.12
Close group climate	1-4.80	2.85 (0.74)	2.93 (0.73)	2.74 (0.70)	3.23 (1.05)	1.89

*Note.* EVF = exposure to family violence, phys./psychol. abuse = physical and psychological abuse.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Table 2. Zero-order Correlations among all the Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Family substance use	-													
2. Family mental health	.47***	-												
3. Family criminality	.45***	.29***	-											
4. EFV	.23*	.25**	.30***	-										
5. Phys./psychol. abuse	.14	.21*	.13	.60***	-									
6. Physical neglect	.01	.08	.07	.31***	.22*	-								
7. Psychological neglect	.21*	.10	.02	.42***	.37***	.67***	-							
8. Trauma symptoms	.36***	.29***	.21*	.27**	.34***	.29***	.29***	-						
9. Externalizing	.15	.20*	.07	.04	.07	.02	.14	.41***	-					
10. Internalizing	.06	.27**	-.07	.00	.10	-.10	.04	.35***	.42***	-				
11. Peer aggression	.20*	.22*	.22*	.16	.07	-.09	.04	.18	.34***	.28***	-			
12. Peer acceptance	-.06	-.02	-.02	-.04	.01	-.03	.04	.04	.04	-.01	-.13	-		
13. Open group climate	-.01	-.15	-.08	.06	-.03	.00	-.03	-.17	-.28***	-.38***	-.16	.42***	-	
14. Close group climate	.21*	.30**	.15	.10	-.01	-.03	.07	-.20*	.28***	.41***	.55***	-.41***	-.53***	-

Note. EVF = exposure to family violence, phys./psychol. abuse = physical and psychological abuse.

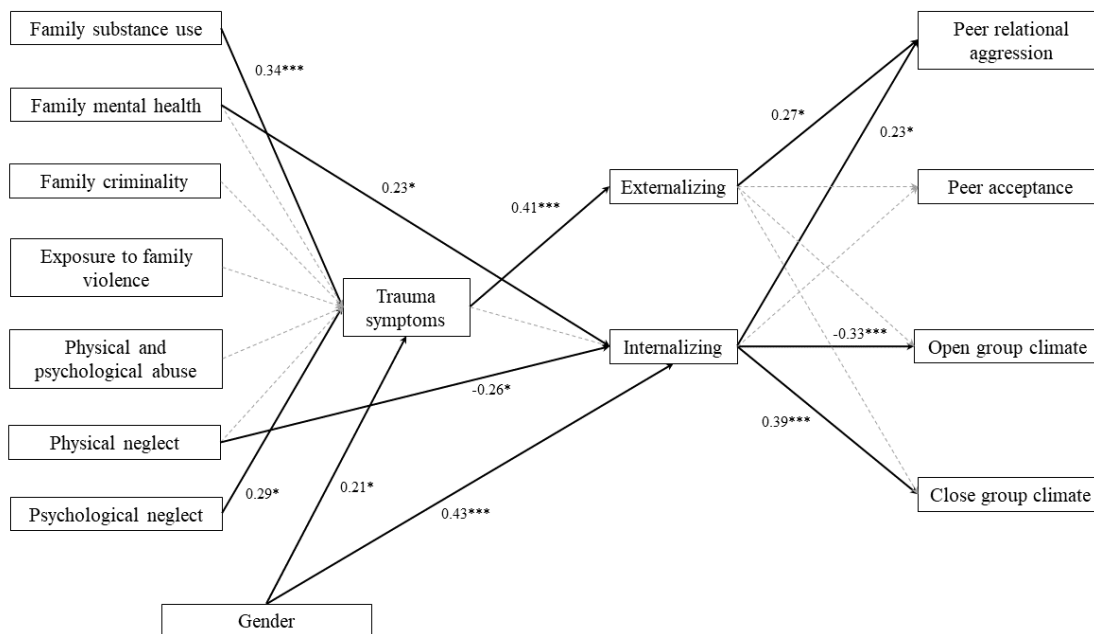
\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 3.** Direct and Indirect Effects from ACEs to Psychological Maladjustment Through Trauma-related Symptoms and from Trauma-related Symptoms to Residential Care Environment Through Psychological Maladjustment

Path	Indirect effects		Direct effects	
	$\beta$ (S.E.)	95% (CI)	$\beta$ (S.E.)	95% (CI)
Family substance use → Trauma → Externalizing	.14 (.05)	.04, .25	.03 (.14)	-.25, .29
Psychological neglect → Trauma → Externalizing	.12 (.06)	.01, .25	.18 (.18)	-.16, .55
Physical/psychological malt. → Trauma → Externalizing	.08 (.05)	-.00, .19	-.05 (.11)	-.26, .16
Family substance use → Trauma → Internalizing	.06 (.04)	-.01, .16	.01 (.11)	-.22, .22
Psychological neglect → Trauma → Internalizing	.05 (.04)	-.01, .15	.13 (.13)	-.14, .37
Physical/psychological malt. → Trauma → Internalizing	.04 (.03)	-.02, .12	-.04 (.09)	-.21, .14
Trauma → Externalizing → Peer aggression	.11 (.05)	.02, .23	.05 (.10)	.01, .37
Trauma → Externalizing → Open group climate	-.04 (.05)	-.15, .04	-.01 (.10)	-.21, .19
Trauma → Externalizing → Close group climate	.05 (.04)	-.03, .14	.04 (.09)	-.14, .21
Trauma → Internalizing → Peer aggression	.04 (.03)	-.01, .11	.05 (.10)	.01, .37
Trauma → Internalizing → Open group climate	-.06 (.04)	-.15, .00	-.01 (.10)	-.21, .19
Trauma → Internalizing → Close climate	.07 (.04)	-.01, .17	.04 (.09)	-.14, .21

Note. Trauma = trauma-related symptoms, physical/psychological malt. = physical and psychological maltreatment.





**Figure 1.** Path Analysis Model Including ACEs, Trauma-related Symptoms, Psychological Maladjustment, and Residential Group Climate Variables, Controlling for Gender.

Note. Significant paths are represented in bold whereas non-significant paths are indicated by dashed lines.