



Research paper

Understanding the influence of early life challenges on alexithymia: A comparative study of offenders and a community sample

Telma Catarina Almeida^{a,*}, Tatiana Gonzaga Redondo^b

^a Egas Moniz School of Health & Science, Egas Moniz Center for Interdisciplinary Research (CiEM), 2829-511 Caparica, Almada, Portugal

^b Egas Moniz School of Health & Science, 2829-511 Caparica, Almada, Portugal

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ABSTRACT

Background: Individuals who experience adverse childhood experiences (ACEs) are likely to display alexithymia and are more prone to engage in criminal behaviors.

Objectives: This study aims to assess the relationship between ACEs and alexithymia, to compare a sample of offenders with a community sample in ACEs and alexithymia, and to analyze the predictors of alexithymia.

Methods: The sample comprised 540 participants of both sexes, with 405 individuals from the community and 135 incarcerated individuals. The participants responded to the sociodemographic questionnaire, the Adverse Childhood Experiences Questionnaire (ACEs), and the Toronto Alexithymia Scale (TAS-20).

Results: Both samples revealed positive correlations between ACEs and alexithymia. Offenders revealed significantly higher scores of ACEs and alexithymia compared to the community sample. Additionally, emotional neglect in childhood is a significant predictor of alexithymia.

Conclusion: The findings emphasize the importance of developing prevention strategies to reduce the prevalence of ACEs and alexithymia and decrease their adverse consequences. Further research must be conducted to understand better the intricate interactions between ACEs, alexithymia, and criminal behavior.

1. Introduction

Over the last few years, there has been an increase in interest and research in the criminal justice field concerning the relationship between adverse childhood experiences (ACEs) and the impact it has on specific life outcomes (Craig et al., 2020). ACEs are potentially traumatic events such as abuse, maltreatment, and residing in a harmful environment for their development that can negatively affect the well-being and health of individuals. Adversity varies in form, severity, and duration (Boullier and Blair, 2018). Furthermore, there are differences in the ACE rates according to some demographic variables such as gender, age, and geographic area (Pace et al., 2024).

The understanding of ACEs, their causes, and their consequences has been significantly improved using the Developmental Psychopathology Perspective, according to Toth and Cicchetti (2013). This perspective encompasses normal and abnormal developmental processes to comprehend possible outcomes better. Similar adverse experiences may lead to different outcomes, and various adverse experiences can result in similar outcomes (Toth and Cicchetti, 2013). Positive life experiences in childhood provide the necessary safety for individuals to acquire

developmental abilities, protecting them against maladjustment trajectories and mental health problems (Cicchetti and Toth, 2009). On the other hand, ACEs can create more vulnerability, facing risk factors in individual development (Toth and Cicchetti, 2013).

Childhood adversity contributes widely to the overall probability of developing a broad span of mental health disorders since they are linked to 44.6 % of childhood-onset disorders and between 25.9 % to 32 % of later-onset disorders (Green et al., 2010). Mainly, ACEs show a strong relationship with mood and anxiety disorders (Sheffler et al., 2020). The existing literature has shown a relationship between ACEs and other adverse life outcomes, such as risky sexual behavior (Craig et al., 2020), chronic diseases such as diabetes (Deschênes et al., 2018), pathologic syndromes (Rzeszutek et al., 2024), legal or illegal performance-enhancing substance use (Ganson et al., 2021), posttraumatic stress disorder (Karatzias et al., 2020), higher unemployment, and offending (Craig et al., 2020). ACEs are associated with mental health conditions in adulthood in both internalizing (e.g., anxiety and depression) as well as externalizing (e.g., substance dependence, antisocial personality) domains (Sheffler et al., 2020), and the experience of ACEs increases the risk of premature mortality (Brown et al., 2009). Furthermore, studies

* Corresponding author.

E-mail address: telma.c.almeida@gmail.com (T.C. Almeida).

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reveal that individuals who report emotional abuse in childhood tend to display reduced emotional responses, emotional instability, incapacity to trust others and to become independent, and suicide or homicide tendencies (Cerqueira and Almeida, 2023). Although the relationship between ACEs and subsequent mental health outcomes is established, there is a need to understand the multiple pathways through which ACEs can operate (Jones et al., 2018).

1.1. ACEs and alexithymia

ACEs can harm emotional regulation, leading to alexithymia (Honkalampi et al., 2019; Muzi and Pace, 2023a). Multiple forms of maltreatment (McCuaig Edge and Lee, 2020), such as physical and emotional abuse, neglect, abandonment, parental death, or incarceration (Muzi, 2020), are associated with alexithymia (Cerqueira and Almeida, 2023; Honkalampi et al., 2019). However, the information about the relationship between ACE and alexithymia is scarce (Honkalampi et al., 2019).

Some researchers assert that alexithymia emerges as a developmental process during childhood following traumatic experiences (McCuaig Edge and Lee, 2020) and varies regarding sex (Mendia et al., 2024). Alexithymia is a multidimensional personality trait composed of difficulty describing and identifying feelings, externally oriented thinking, a cognitive way of thinking focused on pragmatic aspects, and a lack of imagination (Muzi, 2020).

Studies reveal that children who experience emotional abuse are more prone to be emotionally unstable and may perpetuate this pattern during life, which then conditions mental and physical health, the development of caring relationships, and the capacity to describe feelings in adulthood. Additionally, being exposed to trauma in childhood can affect the capacity to reflect and verbalize emotions, which leads to difficulty with emotional processing and alexithymia (Cerqueira and Almeida, 2023).

According to Hahn et al. (2015), children raised in neglectful or unsafe environments do not adequately learn essential skills for emotional regulation and the development and maintenance of long and stable relationships, such as expressing and understanding their own and others' emotional cues. Since it affects emotional regulation, individuals with alexithymia may also demonstrate low self-control and exhibit more impulsive behaviors. It is important to note that alexithymia may vary according to some sociodemographic specificities (Almeida, 2024). Individuals who present alexithymia manifest a decrease in their ability to process cognitive emotions, which is a crucial factor in the development of interpersonal relationships and in learning how to function within relationships (Hahn et al., 2015). Furthermore, they tend to show externalizing and other problems such as social and substance abuse (Muzi and Pace, 2023a), as well as preoccupied attachment and internalizing problems (Muzi and Pace, 2023b).

Studies show that high levels of alexithymia are emotional dysregulation and are an essential risk factor for psychiatric disorders (Preece et al., 2020). For example, a study with patients with major depressive disorder showed that almost all the participants with alexithymia had experienced ACEs (Honkalampi et al., 2019). Furthermore, alexithymia predicts aggressive behavior in offenders (Jansen, 2023). Therefore, interest in the construct has reached forensic settings, where the analysis of alexithymia in offender populations has started (Preece et al., 2020).

1.2. ACEs and criminal behavior

ACEs have been mentioned in the literature as a risk factor for delinquency (Ferreira, 2011) since children who experience childhood victimization are more likely to display aggressive, antisocial behavior, as well as develop into violent, serious, and chronic offenders (Craig et al., 2020). Particularly, physical and sexual abuse in childhood increases violent and criminal behavior in adulthood (Ben-David and Goldberg, 2008; Bouffard and Koeppl, 2012). ACEs are more prevalent

among individuals involved in the justice system than those in the general population (e.g., Almeida and Costa, 2023; Astridge et al., 2023). Furthermore, previous studies determined that offenders who encompass more ACEs are more prone to recidivate (Craig et al., 2020).

During past years, over 1 billion children worldwide from the ages of 2 to 17 years have experienced physical, psychological, and sexual violence or neglect. Victimization and traumatic experiences in childhood have a psychological impact that can stimulate the adoption of delinquent behaviors. Such delinquent behaviors can encompass criminal acts and socially deviant conduct against social rules and norms (i. e., opposition, aggression, and conflicts with authority figures) (Pires and Almeida, 2023).

Prospective and retrospective approaches propose a significant prevalence of abused children in both female and male criminal adult populations. Intergenerational violence is a phenomenon that reflects that criminal behavior, similarly to any other behavior, is learned. Children who experience sexual or physical abuse can learn that those behaviors are common or acceptable, and they can replicate those behaviors in their future lives as a coping mechanism to express their inner disappointment or to reduce stress (Ben-David and Goldberg, 2008).

The link between ACEs and mental health problems in offenders is also well-established (Pessoa and Almeida, 2024). Mental health issues are more prevalent in the offender population than in community populations since it has been reported that of the 2 million prisoners across Europe, at least 400,000 suffer from a mental health disorder (Abreu et al., 2014). According to Turner et al. (2020), it was determined that the prevalence of mental disorder rates across various countries was between 45 % and 90 %, as well as high rates of comorbidity in young adults and juvenile offenders. Furthermore, in multiple cases, mental illness already existed before entering prison and may aggravate during their sentence (Abreu et al., 2014).

1.3. The present study

As mentioned before, literature shows the link between ACEs and criminal and delinquent behavior since children who experience victimization are more prone to display difficulty in self-regulation in multiple regards, are more likely to become associated with problematic peer groups, and, ultimately, resort to aggressive and criminal behaviors (Pires and Almeida, 2023). Studies also verified a relationship between ACEs and alexithymia since being exposed to trauma during childhood may constrain the child's capability to communicate, reflect, and verbalize emotional states. Furthermore, it was stated that individuals exposed to ACEs struggle with emotional processing and identifying and verbalizing feelings (Cerqueira and Almeida, 2023).

The interest in studying alexithymia has been extended to forensic settings. Hence, the researchers began assessing alexithymia in offender populations and hypothesizing that it might justify individual differences in criminal behavior (Preece et al., 2020). Alexithymia has been shown to have a role in emotionally based violent acts, including criminal acts perpetrated by offenders (Kroner and Forth, 1995), since higher scores of alexithymia are related to externalizing symptoms, such as oppositional-deviant, aggressive, and delinquent behaviors (Muzi, 2020). According to Leshem et al. (2019), in several criminal populations, such as prisoners serving lengthy sentences, a significantly higher prevalence of alexithymia was found. Furthermore, the literature reflects that individuals who carry out violent acts share standard clinical features with those who are diagnosed with alexithymia. Alexithymia was also linked with diverse static risk factors (e.g., history of victimization, family characteristics, and community aspects) and criminogenic factors (dynamic factors such as antisocial traits, aggression, impulsivity, lack of empathy, deficient cognitive control, values and beliefs, and substance use). Therefore, alexithymia associated with dynamic and static risk factors can affect the severity of the criminal life cycle (Leshem et al., 2019). To our knowledge, only one study has explored the relationship between ACEs and alexithymia in offenders in

Portugal (Almeida, 2024).

Despite the critical role of ACEs on mental health problems, delinquent behaviors, and emotional dysregulation (Bielas et al., 2016), there is still a need to study alexithymia in offenders (Manole and Enea, 2024). Understanding ACEs and alexithymia in offender populations is crucial because it can give important information to develop targeted interventions and rehabilitation programs aimed at improving emotional processing. Addressing better emotional regulation may reduce impulsivity and aggression and enhance social integration. Therefore, this study intends to assess the relationship between adverse childhood experiences and alexithymia, compare a sample of prisoners with a community sample in the variables above (ACEs and alexithymia), and analyze the significant predictors of alexithymia.

2. Method

2.1. Participants

The study included a sample of 540 participants, aged between 18 and 73 ($M = 33.84$, $SD = 13.71$), from both sexes (284 females and 256 males). The study comprised 405 community individuals aged 18 to 71 ($M = 32.06$, $SD = 14.37$). Within this sample, 270 (66.7 %) individuals were female, and 135 (33.3 %) were male. This study also included incarcerated individuals in Portuguese prisons, comprising 135 participants aged 22 to 68 ($M = 39.19$, $SD = 9.79$). Among this sample, 121 (89.6 %) were male, and 14 (10.4 %) were female. Table 1 presents the remaining information about the sociodemographic variables from the two samples used in this study.

2.2. Measures

A sociodemographic questionnaire was used to collect the

Table 1
Descriptive analysis ($n = 540$).

	Community sample ($n = 405$)		Offenders' sample ($n = 135$)	
	<i>n</i>	%	<i>n</i>	%
Nationality				
Portuguese	400	99	110	81.5
Brazilian	4	1	12	8.9
Cabo Verdian	0	0	8	5.9
Angolan	0	0	3	2.2
Belgian	0	0	1	0.7
Senegalese	0	0	1	0.7
Marital status				
Single	257	63.5	79	58.5
Married/ Consensual union	126	31.1	41	30.4
Divorced	19	4.7	15	11.1
Widower	3	0.7	0	0
Educational level				
4th grade	2	0.4	1	0.7
6th grade	4	1	6	4.4
9th grade	24	5.9	31	23.0
12th grade	194	47.9	47	34.8
High school	117	28.9	36	26.7
Master's degree	56	13.8	12	8.9
PhD	8	2	2	1.5
Recidivism conviction	0	0	76	56.3
Crime of conviction				
Theft	0	0	43	31.9
Drug trafficking	0	0	15	11.1
Homicide	0	0	12	8.9
Attempted Murder	0	0	2	1.5
Fraud	0	0	2	1.5
Kidnaping	0	0	3	2.2
Domestic violence	0	0	4	3
Terrorism	0	0	1	0.7
Other	0	0	11	8

Note. *n* = Number of participants; % = percentage of participants.

following variables: age, sex, nationality, marital status, educational level, recidivism conviction, and crime of conviction.

The **Adverse Childhood Experiences Questionnaire** (ACEs; Felitti et al., 1998; Portuguese version, Pinto et al., 2014) focuses on capturing various adverse experiences during childhood, which can be categorized into two primary groups: personal experiences and family-related experiences. Personal experiences encompass instances such as Physical Abuse, Verbal Abuse, Sexual Abuse, Physical Neglect, and Emotional Neglect. On the other hand, family-related experiences involve having a parent struggling with alcoholism, a mother who has experienced domestic violence, a family member who is incarcerated, a family member diagnosed with a mental illness, and the occurrence of a parent's departure due to divorce, death, or abandonment. The questionnaire employs a straightforward scoring system where each “yes” response is assigned a value of one point. The ACEs Portuguese version (Pinto et al., 2014) shows favorable psychometric properties, as Cronbach's alphas ranged from 0.48 to 0.86. The internal consistency values for the current study were 0.85 for the total score (ACEs), 0.73 for Emotional Abuse, 0.66 for Physical Abuse, 0.60 for Sexual Abuse, 0.65 for Emotional Neglect, and 0.55 for Physical Neglect. Higher values indicate more ACEs.

The **Toronto Alexithymia Scale** (TAS-20; Taylor et al., 1992; Portuguese version, Praceres et al., 2000) is an instrument comprising 20 items designed to assess characteristics of alexithymia. These characteristics include Difficulty in Identifying Feelings (DIF), which evaluates the challenge of recognizing feelings and distinguishing them from bodily responses triggered by emotional arousal. Additionally, the scale measures Difficulty in Describing Feelings (DDF), reflecting the struggle to articulate emotions, and Externally Oriented Thinking (EOT), which evaluates cognitive style and reliance on external cues or guidance. The TAS-20 Portuguese version (Praceres et al., 2000) shows favorable psychometric properties, as Cronbach's alphas ranged from 0.60 to 0.83. The internal consistency values for the current study were 0.85 for the total score (TAS), 0.87 for Difficulty in Identifying Feelings, 0.55 for Difficulty in Describing Feelings, and 0.66 for Externally Oriented Thinking. Higher values indicate more alexithymia.

2.3. Procedure

An online research protocol was shared through social media platforms like Facebook, Instagram, and WhatsApp to collect data from the community sample. All respondents provided informed consent before participating and completed the research protocol electronically. The participants responded voluntarily, and their anonymity was guaranteed. We used a convenience sample with a snowball strategy, with no sample retention or dropout. No financial support, compensation, or incentives were granted to the participants.

We obtained permission from the General Directorate of Reintegration and Prison Services - Ministry of Justice (DGRSP-MJ) to collect data from incarcerated individuals in Portuguese prisons. We then contacted the prison directors, explaining the study objectives and methodology and scheduling the data collection. Incarcerated individuals were contacted and informed about the nature and objectives of the study. It was clear that their participation was entirely voluntary, and the study was conducted with utmost respect for the participants' autonomy. Those who agreed to participate in the study signed an informed consent form, and the research protocol was completed in a paper-and-pencil format inside the prison. Participants for this study were recruited from five Portuguese prisons.

The study followed the ethical principles outlined in the Declaration of Helsinki (World Medical Association, 2024), and the research protocol obtained approval from the Egas Moniz School of Health & Science Ethics Committee.

2.4. Statistical analysis

The statistical analyses for this study were performed using the Statistical Package for the Social Sciences (SPSS) software, specifically version 29.0. Descriptive statistics were employed to summarize the characteristics of the sample and the studied variables. Correlation analysis used Pearson correlations to explore the relationships between the variables. ANCOVA tests were performed to examine differences between the community sample and the sample of offenders in each scale and subscale used in this study. Finally, multiple linear regressions were also performed to analyze the predictive validity of alexithymia.

3. Results

3.1. Correlation analyses

Results in the community sample (Table 2) point to statistically significant positive weak correlations between Difficulty Identifying Feelings, Emotional Abuse ($r = 0.21$), Physical Abuse ($r = 0.15$), Emotional Neglect ($r = 0.37$), Parental Divorce ($r = 0.11$), and the total ACEs ($r = 0.24$). Difficulty Describing Feelings is statistically significant and positively correlated with Emotional Neglect ($r = 0.37$). Externally Oriented Thinking is statistically significant and positively correlated with Emotional Neglect ($r = 0.13$). TAS shows statistically significant positive correlations with Emotional Abuse ($r = 0.17$), Emotional Neglect ($r = 0.32$), and the total ACEs ($r = 0.18$). Statistically significant positive correlations were found between several ACEs, and statistically

significant positive correlations were identified between all the TAS measures.

In the offenders' sample (Table 2), Difficulty Identifying Feelings and TAS showed statistically significant positive weak correlations with Difficulty Identifying Feelings, Emotional Neglect ($r = 0.20$), Violence Exposure ($r = 0.25$), and the total ACEs ($r = 0.22$). Additionally, statistically significant positive correlations were found between several types of ACEs, and statistically significant positive correlations were identified between all the TAS measures.

3.2. Group difference

To conduct a comparative analysis between the community and offender samples (Table 3), sex, age, education level, and marital status were included as covariates since, like in other studies (e.g., Almeida and Costa, 2023; Almeida et al., 2024b), our samples (offenders and community) differ in these variables, and they may have particular interference on the results and for this reason, they should be controlled in this analysis. The findings indicated that individuals within the offender population obtained significantly higher scores of ACEs compared to the community sample on the following measures: Emotional Abuse, Physical Abuse, Sexual Abuse, Emotional Neglect, Physical Neglect, and the total score of ACEs. Additionally, the results reveal that the offender population shows higher scores regarding Alexithymia in the dimensions of Difficulty Identifying Feelings, Difficulty Describing Feelings, and the total TAS.

Table 2

Pearsons correlations between ACEs and TAS ($n = 540$).

Community sample ($n = 405$)															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. EA	–	0.55**	0.18**	0.50**	0.33**	0.30**	0.39**	0.26**	0.30**	0.13	0.76**	0.21**	0.09	0.06	0.17**
2. PA		–	0.17**	0.40**	0.34**	0.20**	0.32**	0.17**	0.23**	0.06	0.67**	0.15**	–0.01	–0.01	0.06
3. SA			–	0.13*	0.11*	0.12*	0.17**	0.10*	0.08	–0.01	0.34**	0.09	0.01	0.04	0.07
4. EN				–	0.31**	0.27**	0.25**	0.24**	0.22**	0.26**	0.02	0.37**	0.23**	0.13**	0.32**
5. PN					–	0.34**	0.43**	0.33**	0.20**	0.16**	0.59**	0.08	0.01	–0.07	0.02
6. PD						–	0.30**	0.17**	0.18**	0.16**	0.50**	0.11*	0.06	0.04	0.10
7. VE							–	0.30**	0.25**	0.05	0.70**	0.06	0.03	–0.03	0.03
8. FSA								–	0.27**	0.06	0.45**	0.06	0.04	0.09	0.08
9. MIS									–	0.03	0.49**	0.09	0.04	0.01	0.07
10. IFM										–	0.30**	–0.01	–0.05	0.04	–0.01
11. ACEs											–	0.24**	0.10*	0.04	0.18**
12. DIF												–	0.65**	0.34**	0.87**
13. DDF													–	0.46**	0.83**
14. EOT														–	0.71**
15. TAS															–

Offenders' sample ($n = 135$)															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. EA	–	0.79**	0.15	0.55**	0.49**	0.20*	0.42**	0.33**	0.33**	0.19*	0.83**	0.13	0.10	0.07	0.12
2. PA		–	0.11	0.50**	0.46**	0.19*	0.40**	0.24**	0.18*	0.06	0.75**	0.08	0.08	0.01	0.07
3. SA			–	0.17*	–0.02	–0.05	0.01	0.01	0.10	0.15	0.26**	–0.02	–0.01	0.17	0.06
4. EN				–	0.29**	0.20*	0.25**	0.14	0.19*	0.19*	0.64**	0.20*	0.14	0.20	0.23**
5. PN					–	0.19*	0.44**	0.35**	0.25**	0.22*	0.65**	0.20	0.12	0.03	0.09
6. PD						–	0.25**	0.18*	0.09	0.07	0.38**	0.01	–0.08	–0.08	–0.06
7. VE							–	0.40**	0.26**	0.06	0.72**	0.25**	0.16	0.10	0.21*
8. FSA								–	0.23**	0.22**	0.51**	0.09	0.06	–0.03	0.05
9. MIS									–	0.07	0.43**	0.10	0.13	0.08	0.12
10. IFM										–	0.30*	0.21*	0.12	–0.07	0.11
11. ACEs											–	0.22*	0.16	0.12	0.20*
12. DIF												–	0.67**	0.44**	0.88**
13. DDF													–	0.42**	0.80**
14. EOT														–	0.77**
15. TAS															–

Note: EA = Emotional Abuse; PA = Physical Abuse; SA = Sexual Abuse; EN = Emotional Neglect; PN = Physical Neglect; PD = Parental Divorce; VE = Violence Exposure; FSA = Family Substance Abuse; MIS = Mental Illness/ Suicide; IFM = Incarcerated Family Member; ACE = Adverse Childhood Experiences; DIF = Difficulty Identifying Feelings; DDF = Difficulty Describing Feelings; EOT = Externally Oriented Thinking; TAS = Total Alexithymia * $p < 0.05$ ** $p < 0.01$.

Table 3
Descriptive statistics and ANCOVA ($n = 540$).

	Community sample ($n = 405$)	Offenders' sample ($n = 135$)		
	$M (SD)$	$M (SD)$	$F (p\text{-value})$	η^2
Emotional Abuse	0.49 (0.75)	0.72 (0.88)	4.02 (0.001)	0.04
Physical Abuse	0.34 (0.62)	0.78 (0.86)	8.46 (<0.001)	0.07
Sexual Abuse	0.11 (0.37)	0.39 (0.66)	8.05 (<0.001)	0.07
Emotional Neglect	0.47 (0.73)	0.78 (0.83)	8.39 (<0.001)	0.07
Physical Neglect	0.09 (0.33)	0.33 (0.60)	7.55 (<0.001)	0.07
ACEs	2.52 (3.08)	5.19 (4.23)	14.41 (<0.001)	0.12
Difficulty Identifying Feelings	17.51 (7.16)	18.32 (7.53)	7.95 (<0.001)	0.07
Difficulty Describing Feelings	14.56 (3.81)	15.76 (4.25)	4.11 (0.001)	0.04
Externally Oriented Thinking	26.22 (4.99)	27.39 (6.51)	1.97 (0.082)	0.02
TAS	58.29 (13.00)	61.47 (15.04)	5.16 (<0.001)	0.05

3.3. Regression analysis

The explanatory model of TAS using a Multiple Linear Regression showed that the model is significant. Durbin-Watson was 1.86, and VIF was <3. Sex, Emotional Abuse, Physical Abuse, Physical Neglect, Sexual Abuse, Divorce/Parental Separation, Exposure to Domestic Violence, Substance Abuse in the Family Environment, Family Mental Illness or Suicide, and Arrest of a Family Member are not significant. For this reason, we performed a new model only with significant paths. We performed a model (Table 4) only with significant paths. The model is significant [$F (1,538) = 54.25, p < 0.001$] and explains 9 % of the variance of TAS. Emotional Neglect ($\beta = 0.30, p < 0.001$) significantly predicts Alexithymia.

4. Discussion

The current study's objective is to assess the relationship between adverse childhood experiences (ACEs) and alexithymia, to compare a sample of offenders with a sample of the community in ACEs and alexithymia, and to analyze the significant predictors of alexithymia.

The findings of the relationship between ACEs and different dimensions of alexithymia offer valuable insights into how childhood adversity may be linked with emotional functioning. In the community sample, some studies have shown that alexithymia is associated with adverse experiences in childhood (Cerqueira and Almeida, 2023), impacting emotional processing (Steffen et al., 2015). In the present study, in the community sample, we verified a relationship between difficulty in identifying feelings, emotional and physical abuse, emotional neglect, parental divorce, and the total ACEs. The difficulty in describing feelings was also related to emotional neglect and the

externally oriented thinking to emotional abuse and neglect. These findings are supported by the existing literature (Berthelot et al., 2015), which states that individuals who experienced emotional neglect show greater difficulty identifying feelings. Some studies also revealed that emotional neglect was associated with difficulties in individual's ability to accurately describe their own emotions, meaning that when children experience emotional neglect, their emotional needs are not adequately met, which can have some impact on their emotional development and their ability to understand and articulate their feelings (Mikulincer et al., 2009). Emotional neglect, characterized by a lack of emotional support and validation during childhood, may deprive individuals of the necessary models for learning how to articulate and express their emotions (Cerqueira and Almeida, 2023). Externally oriented thinking refers to a cognitive style focused on external events rather than internal emotional experiences (Praceres et al., 2000), which can develop in individuals who have experienced emotional abuse or emotional neglect. These adverse experiences may influence how individuals perceive and process emotions (Cramer and Ryst, 2005).

In the offender population sample, the results also showed a relationship between alexithymia, difficulty in identifying feelings, and emotional neglect, which indicates that individuals who experience emotional neglect are more prone to develop difficulty in identifying feelings. As previously mentioned, this corroborates the literature (Besarat and Shahidi, 2011). It also showed a relationship between difficulty identifying feelings, violence exposure, and cumulative ACEs. The literature states that exposure to violence and ACEs is significantly associated with greater difficulty in identifying feelings, and the development of alexithymia might be related to adverse experiences in childhood (Kubiak et al., 2013). The link between emotional dysregulation from early exposure to adverse environments is well established (Milojevich et al., 2020). Studies show that children exposed to violence, whether through direct physical abuse or witnessing domestic violence, are more vulnerable to developing alexithymia later in life. Repeated exposure to traumatic events like violence may disrupt the normal development of emotional regulation systems, leading to reduced skills to identify and process emotions. This is particularly alarming in cases of cumulative ACEs, where multiple forms of trauma co-occur, exacerbating the emotional dysfunction (e.g., Cerqueira and Almeida, 2023).

We compared these two populations to understand the differences between the community and offender samples in the studied dimensions. The findings indicated that individuals within the offender population obtained significantly higher scores of ACEs compared to the community sample on emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, and the total score of ACEs. Several studies demonstrate that offenders report a higher prevalence of different types of ACEs, with childhood abuse and neglect being critical contributors to later aggressiveness (Almeida et al., 2024a), antisocial behavior, and criminality (Almeida and Costa, 2023; Almeida et al., 2024b; Craig et al., 2020). Additionally, studies showed that cumulative ACEs predict recidivism. Therefore, the research acknowledges the association between ACEs and an increased risk of offending (Astridge et al., 2023).

Research has shown that individuals exposed to such experiences often show altered emotion processing, presenting problems in developing emotional regulation (Steffen et al., 2015) and poor impulse control (Almeida et al., 2024a). Our results also show higher scores of alexithymia in offenders, which is corroborated by other studies (e.g., Almeida, 2024; Léveillé and Vignola-Lévesque, 2019). As mentioned, several types of abuse may disturb the development of emotional regulation, making it more difficult for individuals to understand and describe their feelings (Cerqueira and Almeida, 2023; Honkalampi et al., 2019; Preece et al., 2020), developing fewer skills of empathy, with issues in feeling and understanding the feelings of others (Almeida et al., 2024b) which makes it difficult to establish healthy attachment in interpersonal relationships (Almeida and Costa, 2023).

The results also indicated that emotional neglect in childhood is a

Table 4
Multiple linear regression with alexithymia ($n = 540$).

Variable	β	T	p	Adj R^2	ΔR^2	F
				0.92	0.90	$F (1,538) = 54.25, p < 0.001$
Emotional Neglect	0.30	7.37	< 0.001			

significant predictor of alexithymia. According to Honkalampi et al. (2019), various forms of maltreatment, such as the emotional one, are associated with alexithymia, suggesting that, as mentioned before, individuals who have experienced emotional neglect are at an increased risk of developing this issue (Almeida, 2024; Cerqueira and Almeida, 2023) due to the modified emotion processing (Steffen et al., 2015). The research also established an association between higher levels of alexithymia and an increased risk of reoffending, suggesting a potential role of alexithymia in the persistence of criminal behavior (Hayashi et al., 2019). Alexithymia may also contribute to increased social isolation by limiting the ability to communicate effectively and express emotions, causing problems with interpersonal interactions (Panahi et al., 2018). For example, in some cases, the difficulty in coping and verbalizing their feelings in individuals with alexithymia explains the use of violence in the relationship as a form of a deficient problem-solving strategy (Di Piazza et al., 2017), leading to loneliness (Al-shahrani and Hammad, 2023).

4.1. Limitations

Despite the significant contributions, some limitations should also be considered. First, the study's sample size is relatively small, and the offender population predominantly consists of male participants, while the community sample mainly consists of female participants. Future studies should increase the sample size and strive for a more balanced gender representation. Second, using a self-report protocol for data collection constitutes a limitation as it lacks control over some responses' bias due to possible social desirability and individual perceptions. This can result in some individuals omitting or altering their responses. Therefore, it is essential to consider social desirability as a potential limitation when interpreting the results, given that social desirability refers to the tendency of individuals to respond in a manner that they believe is socially acceptable rather than providing honest or accurate responses (Vesely and Klöckner, 2020). Individuals' subjective perceptions also shape self-reports, and they can also present some biases in the objective reality. Third, some measure specificities should be considered; namely, the ACEs instrument does not address all childhood adversities, and future studies should include additional adverse experiences (Afifi, 2020). Also, an interview for alexithymia could give more important information about the experience (Muzi et al., 2023). Fourth, the two samples were recruited using different methods (online vs paper-and-pencil), which may impact how participants respond to questions (e.g., because the community sample completed the protocol online, participation was limited to individuals with internet access, and the paper-and-pencil may influence social desirability bias). Fifth, correlation and some group comparison results (Emotional Abuse, Difficulty Describing Feelings, and Externally Oriented Thinking) should be interpreted cautiously, considering the analyses' weak correlations and small effect sizes. Considering these limitations, the results should be understood with caution.

4.2. Conclusions and implications for practice

Despite the limitations, this innovative study assesses the role of ACEs in alexithymia using a community sample and a sample of offenders, being a relevant study for the fields of Forensic and Clinical Psychology and Criminology regarding the association between ACEs, alexithymia, and criminal behaviors. Overall, this study provides evidence for the relationship between adverse childhood experiences and alexithymia in a sample of the community and a sample of offenders. It highlights the higher prevalence of ACEs and alexithymia in the offender population, emphasizing the importance of addressing childhood victimization and emotional processing difficulties in understanding and addressing criminal behavior. Furthermore, this research shows the predictive role of emotional neglect in alexithymia.

When recognizing the detrimental impact of ACEs throughout an

individual's life, it becomes imperative to develop preventive strategies targeted at parents that emphasize the importance of providing a nurturing environment for healthy child development, reducing the likelihood of ACEs, and promoting the adoption of healthy behaviors in adulthood (Merrick et al., 2017). Furthermore, promoting several positive childhood experiences is crucial since they may buffer the negative impact of ACEs (Almeida et al., 2024b).

Implementing targeted awareness programs for young people in schools may play an important role in preventing maladaptive behaviors. These programs should encompass various subjects, including child victimization, emotional recognition and expression, and addressing mental health concerns among youth (Almeida and Costa, 2023). Through the provision of community-based solutions like victim support and psychological interventions, these initiatives aim to raise awareness about seeking help and combating violence. This knowledge can also be effectively utilized in advertising campaigns to educate the community about the detrimental effects of child victimization, thereby minimizing its impact.

Given the significant prevalence of ACEs identified in this study's sample and its link with alexithymia, it is crucial for individuals affected by such experiences to receive therapy and appropriate intervention to address the effects (Cerqueira and Almeida, 2023). Mental health support should be developed to address the psychological impacts of ACEs and alexithymia. Support should also be provided to help offenders process and cope with past traumas. Trauma-focused interventions have proven efficacy in addressing the effects of ACEs and supporting individuals in their journey toward healing and recovery (Hildenbrand et al., 2020). Working with offenders on identifying and verbalizing their emotions could facilitate their ability to develop skills to control their emotions better and interact more healthily with society and intimate relationships.

Moreover, further research is necessary to gain a deeper understanding of the relationship between ACEs, alexithymia, and their influence on involvement in criminal behaviors. Such studies will contribute to the development of more effective prevention and intervention programs to prevent criminal behaviors, incarceration, and recidivism.

CRedit authorship contribution statement

Telma Catarina Almeida: Writing – review & editing, Writing – original draft, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Tatiana Gonzaga Redondo:** Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Data curation.

Ethical approval

The Egas Moniz School of Health & Science Ethics Committee approved the present research (N. 1119).

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Declaration of competing interest

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

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