



Article

The Mediating Effect of Post-Traumatic Growth on the Relationship between Adverse Childhood Experiences and Psychological Distress in Adults

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Abstract: Background: Research has shown that Adverse Childhood Experiences (ACEs) are prevalent and are associated with psychological distress. Some studies indicate facing these adversities can lead to post-traumatic growth. This study aims to assess the impact of ACEs on psychological distress and post-traumatic growth and to determine the mediating effect of post-traumatic growth between ACEs and psychological distress, in a sample of adults. Methods: In this study, there were 521 participants (mean = 31.32, SD = 12.28), who answered the following surveys online: a sociodemographic questionnaire, the Family ACE Questionnaire, the Kessler Psychological Distress Scale (K10) and the Post-Traumatic Growth Inventory (PTGI). Results: ACEs were positive and significant predictors of psychological distress, and the “Change in the perception of the self and life in general” factor of post-traumatic growth was the strongest predictor of lower perceived psychological distress. Post-traumatic growth did not mediate the relationship between ACEs and psychological distress. Conclusions: These findings contribute to the improvement of clinical practice and health policies and highlight the need for a more in-depth understanding of the impact of ACEs on mental health.

Keywords: ACEs; childhood; psychological distress; post-traumatic growth



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1. Introduction

Adverse Childhood Experiences (ACEs) are stressful events of a traumatic nature that occur in the first 18 years of an individual’s life, which contribute to the absence of secure and stable family relationships (APA 2023), as well to the negative impact on the physical and mental health of the individuals who experience them (Felitti et al. 1998). These experiences and their repercussions on adult health were described for the first time in a study by Felitti and collaborators (1998) and are considered risk factors for morbidity and mortality (Jones et al. 2020; Ramiro et al. 2010). ACEs include types of abuse (emotional, physical, and sexual), exposure to domestic violence, substance abuse in the family environment, divorce or parental separation, imprisonment of a family member and mental illness or suicide, and neglect (emotional and physical) (Silva and Maia 2008).

ACEs are some of the most common and profound sources of stress in early life (Boullier and Blair 2018; WHO 2020) and can lead to the disruption of the child’s physical and psychological health (Kalmakis and Chandler 2014). However, they may not only negatively affect health and well-being at the time they occur, but also later in life (Soares et al. 2016), which will be discussed later.

Many studies show that more than half of individuals have experienced at least one ACE (Esaki and Larkin 2013; Felitti et al. 1998; Hales et al. 2023; Manyema et al. 2018; Merrick et al. 2017; Nevárez-Mendoza and Ochoa-Meza 2022; Soares et al. 2022). The most

common types of ACEs are emotional abuse (67–82.9%) (Amaranggani and Dewi 2022; Goodman et al. 2022), emotional neglect (60–82.2%) (AlHemyari et al. 2022; Craig et al. 2023), parental separation or divorce (42–77.6%) (Martin et al. 2022; Soares et al. 2016), and substance abuse in the household (25.6–31.6%) (Felitti et al. 1998; Nevárez-Mendoza and Ochoa-Meza 2022). The least common are sexual abuse (1.4–4%) (Manyema et al. 2018; Soares et al. 2016), the incarceration of a family member (3.4–5%) (Babad et al. 2022; Craig et al. 2023) and physical neglect (4.1–4.6) (Nevárez-Mendoza and Ochoa-Meza 2022; Soares et al. 2016).

1.1. Sociodemographic Disparities in ACEs

A considerable body of research has studied differences in ACEs by demographic variables. Regarding gender, some studies found that women experience more ACEs (AlHemyari et al. 2022; Campbell et al. 2016; Giano et al. 2020; Soares et al. 2016; Wong et al. 2019), while others indicate that the prevalence of ACEs is higher in men (Almuneef et al. 2017; Giovanelli et al. 2016; Hales et al. 2023). However, there seems to be a consensus on the higher prevalence of sexual abuse (Martin et al. 2022; Sánchez-Jáuregui et al. 2023; Soares et al. 2016), emotional neglect (AlHemyari et al. 2022; Martin et al. 2022; Soares et al. 2016; Yuan et al. 2021) and exposure to domestic violence (AlHemyari et al. 2022; Soares et al. 2016) in women. As for men, they seem to experience more physical abuse (Almuneef et al. 2017; Yuan et al. 2021) and exposure to substance abuse (Almuneef et al. 2017; Nevárez-Mendoza and Ochoa-Meza 2022).

Regarding age, younger individuals present a greater number of ACEs compared to older people (Campbell et al. 2016; Felitti et al. 1998; Nevárez-Mendoza and Ochoa-Meza 2022; Riedl et al. 2020) who exhibit better mental health (Nurius et al. 2015). However, although younger people report more experiences of emotional abuse, older people have greater experiences of physical neglect (Novais et al. 2021; Riedl et al. 2020). Freed et al. (2018) found that most adult individuals perceive a deterioration in the well-being of children today compared to when they were children. In addition, the findings of a study by Hughes et al. (2017) indicate that Millennials, Generation Z, and Generation X are more likely to experience a high number of ACEs compared to Baby Boomers, suggesting greater health risks associated with ACEs for younger generations.

When it comes to ethnic and racial minorities (non-Caucasian individuals), they display a higher number of ACEs (Giano et al. 2020; Hales et al. 2023), as do sexual minorities (non-heterosexual people) (Giano et al. 2020), people with lower incomes (Campbell et al. 2016; Giano et al. 2020) and those who have lower levels of education (Campbell et al. 2016; Giano et al. 2020; Wong et al. 2019).

1.2. The Long-Term Impact of ACEs

ACEs can be a contributing factor to the occurrence of risk behaviors, such as exposure to risky sexual behaviors—early sex life (Novais et al. 2021), multiple sexual partners, sexually transmitted diseases (Felitti et al. 1998; Novais et al. 2021) and unwanted pregnancy (Ramiro et al. 2010)-, smoking (Felitti et al. 1998; Hughes et al. 2017; Novais et al. 2021; Ramiro et al. 2010), alcohol use (Felitti et al. 1998; Hughes et al. 2017; Merrick et al. 2017; Ramiro et al. 2010), drug use (Felitti et al. 1998; Merrick et al. 2017), self-harm behaviors (Novais et al. 2021) and suicide attempts (Felitti et al. 1998; Lu et al. 2008; Merrick et al. 2017; Silveira and Pereira 2023; Thompson et al. 2019).

As for physical health, ACEs are known to contribute to high blood pressure (AlHemyari et al. 2022), obesity (AlHemyari et al. 2022; Felitti et al. 1998; Nevárez-Mendoza and Ochoa-Meza 2022), diabetes (Campbell et al. 2016; Monnat and Chandler 2015; Novais et al. 2021), heart problems (Felitti et al. 1998; Monnat and Chandler 2015; Ramiro et al. 2010), and chronic diseases (Boullier and Blair 2018; Jones et al. 2020).

There is also an association between ACEs and psychosocial problems, such as difficulties in controlling anger (Anda et al. 2006), sleep disturbance (Anda et al. 2006), loneliness (Agbaje et al. 2021; Babad et al. 2022; Wong et al. 2019), panic attacks (Anda et al. 2006),

PTSD (Brockie et al. 2015; Lu et al. 2008) and suicidal thoughts or suicidal ideation (Thompson et al. 2019; Thai et al. 2020; Wong et al. 2019).

1.3. The Relationship between ACEs and Psychological Distress

Recent studies have also found an association between ACEs and psychological distress (PD) (Agbaje et al. 2021; Jones et al. 2022; Manyema et al. 2018; Thai et al. 2020). *Psychological distress* is the result of physical and psychological symptoms experienced by the individual (Varela et al. 2017) that are based on emotional suffering such as depression (Agbaje et al. 2021; Belay et al. 2021, Serviço Nacional de Saúde 2018; Varela et al. 2017), anxiety (Agbaje et al. 2021; Belay et al. 2021; Serviço Nacional de Saúde 2018; Varela et al. 2017), stress (Agbaje et al. 2021), and somatic symptoms (Serviço Nacional de Saúde 2018). Research suggests that ACEs are related to depression and anxiety (Watt et al. 2019; Qu et al. 2022; Riedl et al. 2020; Silveira and Pereira 2023). However, a study by Elmore and Crouch (2020) found that ACEs have a greater impact on depression, with emotional abuse (Chapman et al. 2004; Qu et al. 2022; Silveira and Pereira 2023; Qu et al. 2022) and a family history of mental illness (Giano et al. 2021; Pinto et al. 2015) being significant risk factors when it comes to the occurrence of this mood disorder. At the same time, PD is linked to sadness and low self-esteem (Agbaje et al. 2021; Varela et al. 2017), aggression (Agbaje et al. 2021), unhappiness, loss of interest and excessive tiredness (Belay et al. 2021), hopelessness (Belay et al. 2021; Varela et al. 2017), and tension and agitation (Belay et al. 2021; Varela et al. 2017).

1.4. Post-Traumatic Growth

Despite the negative implications of stressful or traumatic life events, they can be a catalyst for *posttraumatic growth* (PTG), which is the positive psychological change experienced by people after being confronted with a traumatic event, adversity, or complicated life circumstances (Calhoun and Tedeschi 1999, p. 11; Jayawickreme et al. 2020; Tedeschi and Calhoun 1996; Tedeschi and Calhoun 2004). PTG may occur simultaneously with PD, which is the product of attempts to adapt to adverse events (Tedeschi and Calhoun 2004). PTG is not about ending suffering (Kaye-Tzadok and Icekton 2022), nor about accepting the traumatic event itself, but rather about accepting the processes by which people assimilate and accommodate the contrast generated by the ACEs by re-establishing the perceptions that individuals have about themselves, and perceptions of the outside world, which results in a positive change (Quan et al. 2022). PTG has been reported by people who have lived through adverse experiences such as illness (Devine et al. 2010), childhood maltreatment (Mohr and Rosén 2017), breast cancer (Campos et al. 2021), natural disasters (Jin et al. 2014), and bereavement (Stein et al. 2018). The psychological changes reported by individuals are based on three domains: greater openness to new possibilities and greater involvement in interpersonal relationships, change in perception of self and life in general, and spiritual change (Resende et al. 2008).

1.5. Portuguese Context

According to a report from the Portuguese Association for Victim Support (2023), in Portugal, the profile of the victim in children and young people is predominantly female (60%), with an average age of ten (14.1%), and commonly is the child of the perpetrator (31.6%), with 2595 victims in 2022. The second most reported crime in that year was sexual crimes against children and young people (4.9%). According to the annual report of the National Commission for the Promotion of the Rights and Protection of Children and Young People (2023), the most frequent occurrence in 2022 was neglect (30.5%). There was also sexual abuse and emotional abuse, with a higher prevalence in females (76%). Emotional abuse and physical abuse were found mainly in children and young people between the ages of 11 (33.5%) and 14 (31.6%).

Some Portuguese studies have explored the prevalence of ACEs, such as Soares et al. (2022), who conducted a study in a Portuguese sample in which 96.2% of the children

had at least one ACE domain. Also, a study from [Silva and Maia \(2010\)](#) based on an adult sample showed that 88% of the participants claimed to have experienced at least one ACE category. Furthermore, research from [Pinto et al. \(2015\)](#) revealed that almost 96,0% of women reported being exposed to at least one ACE domain during childhood and adolescence with physical abuse (46.2%) and emotional abuse (33.8%) being the most prevalent. Lastly, a study conducted by [Alves et al. \(2022\)](#) with inmate women showed that 83.5% reported having experienced some type of ACE, particularly physical abuse (42%) and sexual abuse (42%).

Previous investigations have revealed the negative long-term impact of these experiences on the mental health of individuals, such as [Maia et al. \(2006\)](#), who found an association between adverse experiences and present-day symptomatology. Moreover, [Silva and Maia \(2010\)](#) showed that adversity in childhood was linked with an increased risk for suicide attempts, and [Pinto et al. \(2015\)](#) showed a relationship between ACE exposure, depressive symptoms, and suicide attempts. In addition, [Novais et al. \(2021\)](#) showed higher scores of anxiety for individuals who experienced ACEs. However, there is no substantial theoretical evidence to support the mediating effect of post-traumatic growth on the relationship between ACEs and psychological distress in a sample of adults. Therefore, this study aims to assess the impact of ACEs on psychological distress and PTG to determine the mediating effect of PTG between ACEs and psychological distress, as well as to explore the mutual influence of these variables, based on an adult sample. This will lead to a richer and deeper understanding of a scarce and developing area of study.

2. Materials and Methods

2.1. Participants

This study's sample consisted of 521 participants aged between 18 and 80 (Mean = 31.32; SD = 12.28), of whom 345 (66.2%) identified themselves as women, 166 (31.9%) as men, and 10 (1.9%) as other. Most participants are European/white (94%), have Portuguese nationality (95%), live in Portugal (96.1%), live in a small town (44.5%), are employees (47.2%), have an average socio-economic status (53.9%), and are heterosexual (84.4%). [Table 1](#) shows the sociodemographic characteristics of the sample in greater detail.

Table 1. Sociodemographic characteristics ($n = 521$, $M_{age} = 31.32$, $SD_{age} = 12.28$).

		<i>n</i>	%
Gender	Female	345	66.2
	Male	166	31.9
	Other	10	1.9
Sexual Orientation	Heterosexual	440	84.4
	Non-heterosexual	81	15.6
Race/ethnicity	White/European	490	94
	African/Black	1	0.02
	Mixed Race	11	2.1
	Hispanic/Latino	16	3.1
	Asian	2	0.4
	Other	1	0.2
Nationality	Portuguese	495	95
	Other	26	5
Country of residence	Portugal	501	96.1
	Other	20	3.9
Place of residence	Small rural area	128	24.6
	Large rural area	59	11.3
	Small urban area	232	44.5
	Large urban area	100	19.2
	Other	2	0.4

Table 1. Cont.

		<i>n</i>	%
Socioeconomic status	Lower	31	6
	Lower middle	165	31.6
	Middle	281	53.9
	Upper middle	44	8.5
Professional status	Unemployed	9	1.7
	Employed	246	47.2
	Student	165	31.6
	Student-worker	47	9.1
	Self-employed	49	9.4
	Retired	3	0.6
	Other	2	0.4
Education	High school or less	225	43.2
	Bachelor's degree	189	36.3
	Master's degree	88	16.9
	Doctorate/Ph.D.	8	1.5
	Other	11	2.1
Marital status	Single	168	32.2
	Dating	177	34
	Married	108	20.7
	De facto union	42	8.1
	Separated/divorced	20	
	Widower	5	1 3.8
	Other	1	0.2
Living situation	Living alone	71	13.6
	Living with another person	104	20
	Living with two people	157	30.1
	Living with three people	151	29
	Living with four people or more	38	7.3

2.2. Instruments

The questionnaires were selected to gather information according to the variables and goals of the present study. A Sociodemographic Questionnaire, the Portuguese-language version of the Family Adverse Childhood Experiences Questionnaire, was used to assess the report of ACEs, the Kessler Psychological Distress Scale (K10) was used to assess anxiety and depressive symptoms, and the Post-Traumatic Growth Inventory (PTGI) was used to assess the perception of positive psychological changes after facing adversity.

The Sociodemographic Questionnaire was used to collect data on age, gender, nationality, sexual orientation, marital status, living situation, place of residence, socioeconomic status, education, professional status, and ethnic/racial group.

The Portuguese-language version of the Family Adverse Childhood Experiences Questionnaire (Silva and Maia 2008) was used to assess the report of ACEs and consists of the following domains: emotional abuse, physical abuse, sexual abuse, exposure to domestic violence, substance abuse in the family environment, divorce or parental separation, imprisonment of a family member, mental illness or suicide, physical neglect, and emotional neglect. These domains are assessed through 10 items, adapted from the original 77 items (Felitti et al. 1998), and the participant's responses were evaluated on a Likert scale from 1 (*Never*) to 5 (*Many Times*). In the present study, Cronbach's alpha was 0.81, showing a good internal consistency.

The Kessler Psychological Distress Scale (K10) (Pereira et al. 2019) was used to assess levels of psychological distress, keeping the original items (Kessler et al. 2003). It is based on questions related to depressive symptomatology (items 1, 4, 7, 8, 9, and 10) and anxious symptomatology (items 2, 3, 5, and 6) over the last month. The participants' answers were given on a Likert scale from 1 (*Never*) to 5 (*Always*). The Cronbach's alpha for the instrument Portuguese population was 0.91. For this study, Cronbach's alpha was calculated for the total scale and the two sub-scales, obtaining results of 0.94, 0.93, and 0.89 for the total scale, depression, and anxiety, respectively. Thus, the instrument showed good internal consistency.

The Post-traumatic Growth Inventory for the Portuguese Population (Resende et al. 2008), adapted from the original version of the Post-traumatic Growth Inventory (PTGI) by Tedeschi and Calhoun (1996), was used to assess the positive psychological changes reported by individuals who had experienced adverse life events. PTG is assessed based on three factors: (1) Greater openness to new possibilities and greater involvement in interpersonal relationships (items 3, 6, 7, 8, 9, 11, 15, 16, 17, 20, and 21), (2) Change in perception of self and life in general (items 1, 2, 4, 10, 12, 13 and 19), and (3) Spiritual change (items 5 and 18). These factors were assessed using the 21 original items, and the respondent's answers were given on a Likert scale from 1 (*Nothing*) to 5 (*A lot*) considering that the participants' opinion corresponds to the degree to which they consider themselves to have changed because of a particular trauma. The Post-traumatic Growth Inventory for the Portuguese Population (Resende et al. 2008) showed an alpha of 0.95 for the total scale, an alpha of 0.94 for the greater openness to new possibilities and greater involvement in interpersonal relationships factor, an alpha of 0.84 for the change in perception of self and life in general factor, and finally, an alpha of 0.64 for the spiritual change factor. In this study, the Cronbach's alpha values for the total scale were 0.96, for the the factor "greater openness to new possibilities and greater involvement in interpersonal relationships" was 0.93, for the factor "change in perception of self and life in general" was 0.91, and for the factor "spiritual change" was 0.48. The instrument showed good internal consistency.

2.3. Procedures

The present study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of the University of Beira Interior, Portugal, for studies involving humans (CE-UBI-Pj-2021-047), ensuring all subjects gave their informed consent for inclusion before they participated in the study. This study ensures the principles of informed consent, guaranteeing the confidentiality and anonymity of the data, beneficence, and respect for the integrity of the participants, who were informed about the purpose of the study and the voluntary nature of their participation in the research.

For the investigation, a website was designed to disseminate the online survey on the Microsoft Forms platform via social networks and mailing lists from September to November 2023. Following data collection, a database was built in IBM SPSS Statistics (version 29, Armonk, NY, USA), in which the information was encrypted so that access to the participant's identification was impossible.

To establish associations between ACEs and PTG, all participants who did not report ACEs but experienced PTG were eliminated, going from 749 respondents to 521 as the final sample.

2.4. Data Analysis

The gathered data were submitted to several statistical analyses according to the goals established for this investigation. Descriptive statistics (mean, standard deviation, percentages, and frequencies) were conducted to describe the prevalence and levels of Total ACEs and domains, levels of PD and subscales of anxiety and depression, as well as Total PTG and its factors, (1) greater openness to new possibilities and greater involvement in interpersonal relationships, (2) change in perception of self and life in general, and (3) spiritual change, in the general sample. Also, three-sample student *t*-tests were used to compare differences in means of Total ACEs and domains, Total PD, anxiety, depression, and Total PTG and its factors, by gender, age group, and sexual orientation. To assess the strength and direction of possible associations between age, Total ACEs, the ten domains of childhood adversity, Total DP and its subscales—*anxiety*, *depression*, Total PTG and its factors, Pearson's correlations were calculated. Additionally, one multiple linear hierarchical regression was performed to assess the predictive power of Total ACEs, ACE domains, sociodemographic variables, and Total PTG and its factors on Total PD. Finally, computer software by Hayes (2012 v4.2) was used to assess whether the relationship between Total ACEs and Total PD is mediated by the Total PTG. For all analyses, a *p*-value

of <0.05 was considered statistically significant. Since this was a cross-sectional, descriptive, inferential, correlational, predictive, and mediational study and not an experimental or quasi-experimental one, we did not apply any treatment, and no control group was needed.

3. Results

Table 2 shows the prevalence of Total ACEs and domains in the overall sample. In this sample, 100% of participants reported at least one ACE. Emotional abuse was the most reported domain (59.7%), followed by emotional neglect (52.1%) and mental illness or suicide of a family member (51.4%). Other categories of ACEs and their respective prevalence can be found in more detail in Table 2.

Table 2. ACEs prevalence.

ACE Categories	Responses	<i>n</i>	%
Emotional abuse	No	210	40.3
	Yes	311	59.7
Physical abuse	No	360	69.1
	Yes	161	30.9
Sexual abuse	No	420	80.7
	Yes	101	19.3
Emotional neglect	No	250	47.9
	Yes	271	52.1
Physical neglect	No	465	89.2
	Yes	56	10.8
Divorce/parental separation	No	392	75.2
	Yes	129	24.8
Domestic violence in the household	No	416	79.8
	Yes	105	20.2
Substance abuse in the household	No	344	66
	Yes	177	34
Mental illness or suicide of a family member	No	253	48.6
	Yes	268	51.4
Incarceration of a family member	No	452	86.7
	Yes	69	13.3
Total ACEs	No	0	
	Yes	521	100%

Table 3 shows the descriptive statistics for Total ACEs and ACE domains as well as Total PTG and its factors—Factor 1 and seven items for Factor 2—on top of PD and its respective subscales—anxiety and depression. In the general sample, the mean of Total ACEs is 1.66 (*SD* = 0.61) with a sum of 16.56, the mean of Total PTG is 3.18 (*SD* = 0.86) with a sum of 66.34, and the mean of Total PD is 2.51 (*SD* = 0.83) with a sum of 25.05. All descriptive statistics can be found in more detail in Table 3.

Table 3. Levels of ACEs, PTG, and PD.

Variable	M	SD	SUM
Total ACEs	1.66	0.61	16.56
Emotional abuse	2.23	1.28	2.23
Physical abuse	1.59	1.07	1.59
Sexual abuse	1.37	0.89	1.37
Emotional neglect	2.01	1.22	2.01
Physical neglect	1.20	0.68	1.20
Divorce/parental separation	1.57	1.13	1.57
Domestic violence in the household	1.43	1	1.43
Substance abuse in the household	1.79	1.28	1.79
Mental illness or suicide of a family member	2.15	1.40	2.15
Incarceration of a family member	1.25	0.74	1.25
Total PTG	3.18	0.86	66.34
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	3.19	0.90	34.93
PTG Factor 2 (Change in perception of self and in life in general)	3.36	0.93	23.40
PTG Factor 3 (Spiritual Change)	2.92	1.07	5.20
Total PD	2.51	0.83	25.03
Anxiety	2.56	0.84	10.20
Depression	2.47	0.90	14.83

Table 4 describes the average levels of the 10 items assessing ACEs, including Total ACEs and its domains, the 10 items assessing PD including Total PD and its subscales—4 items for anxiety and 6 items for depression—and the 21 items assessing PTG including Total PTG and its factors—11 items for Factor 1, 7 items for Factor 2, and 2 items for Factor 3, by age group.

Table 4. Prevalence of ACEs, PTG, and PD by gender.

	Woman (n = 345)		Men (n = 166)		t(df)	p
	M	SD	M	SD		
Emotional abuse	2.31	1.31	2.00	1.19	2.548 (509)	0.011 **
Physical abuse	1.60	1.1	1.56	1.03	389 (511)	0.698
Sexual abuse	1.48	1	1.13	0.51	4.355 (509)	<0.001 **
Emotional neglect	2.11	1.28	1.78	1.06	2.881 (510)	0.004 **
Physical neglect	1.19	0.66	1.21	0.66	−0.340 (510)	0.734
Divorce/parental separation	1.59	1.14	1.45	1	1.385 (511)	0.167
Domestic violence in the household	1.46	1.06	1.34	0.81	1.308 (511)	0.192
Substance abuse in the household	1.80	1.33	1.75	1.17	0.404 (510)	0.687
Mental illness or suicide of a family member	2.28	1.46	1.80	1.20	3.726 (511)	<0.001 **
Incarceration of a family member	1.27	0.81	1.21	0.57	0.893 (507)	0.372
Total ACEs	1.71	0.62	1.52	0.53	3.321 (511)	<0.001 **
Anxiety	2.68	0.83	2.25	0.78	5.5476 (511)	<0.001 **
Depression	2.59	0.91	2.19	0.82	4.787 (511)	<0.001 **
Total PD	2.62	0.83	2.21	0.75	5.356 (511)	<0.001 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	3.34	0.85	3.10	0.98	1.714 (510)	0.087

Table 4. Cont.

	Woman (n = 345)		Men (n = 166)		t(df)	p
	M	SD	M	SD		
PTG Factor 2 (Change in perception of self and in life in general)	3.41	0.88	3.27	1.02	1.588 (511)	0.113
PTG Factor 3 (Spiritual Change)	2.96	1.04	2.84	1.12	1.210 (510)	0.227
Total PTG	3.23	0.81	3.08	0.95	1.831 (511)	0.068

** p < 0.001.

Statistically significant differences were found in Total ACEs ($t(511) = 3.321; p < 0.001$), with women scoring higher when compared to men ($M = 1.71, SD = 0.62$). Concerning Total PD, we also found statistically significant differences ($t(511) = 5.356; p < 0.001$), with women also reporting greater scores ($M = 2.62, SD = 0.83$). No statistically significant differences were found in Total PTG ($t(511) = 1.831; p = 0.068$). The results can be found in more detail in Table 4.

Table 5 describes the average levels of the 10 items assessing ACEs, including Total ACEs and its domains, the 10 items assessing PD including Total PD and its subscales—4 items for anxiety and 6 items for depression—and the 21 items assessing PTG including Total PTG and its factors—11 items for Factor 1, 7 items for Factor 2, and 2 items for Factor 3 by age group.

Table 5. Prevalence of ACEs, PTG and PD, by age group.

	Younger People (n = 287) (18–31 Years)		Older People (n = 234) (32–80 Years)		t(df)	p
	M	SD	M	SD		
Emotional abuse	2.24	1.26	2.19	1.31	0.424 (499)	0.672
Physical abuse	1.48	0.97	1.68	1.14	−2.060 (501)	0.040 *
Sexual abuse	1.32	0.78	1.42	0.98	−1.264 (499)	0.207
Emotional neglect	2.09	1.23	1.90	1.21	1.753 (500)	0.080
Physical neglect	1.13	0.55	1.26	0.77	−2.183 (500)	0.029 *
Divorce/parental separation	1.69	1.22	1.41	0.98	2.819 (501)	0.005 *
Domestic violence in the household	1.40	0.96	1.46	1.02	−0.623 (501)	0.534
Substance abuse in the household	1.75	1.24	1.84	1.34	−0.778 (500)	0.437
Mental illness or suicide of a family member	2.30	1.48	1.96	1.26	2.701 (501)	0.007 *
Incarceration of a family member	1.26	0.73	1.22	0.73	0.559 (497)	0.577
Total ACEs	1.67	0.60	1.53	0.59	0.626 (501)	0.532
Anxiety	2.72	0.85	2.37	0.78	4.716 (501)	<0.001 **
Depression	2.61	0.90	2.32	0.89	3.632 (501)	<0.001 **
Total PD	2.65	0.82	2.33	0.80	4.284 (501)	<0.001 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	3.06	0.90	3.36	0.86	−3.884 (500)	<0.001 **
PTG Factor 2 (Change in perception of self and in life in general)	3.22	0.93	3.53	0.89	−3.873 (501)	<0.001 **
PTG Factor 3 (Spiritual Change)	2.72	1.05	3.18	1.04	−4.905 (500)	<0.001 **
Total PTG	3.03	0.84	3.36	0.84	−4.390 (501)	<0.001 **

* p < 0.05, ** p < 0.001.

The results indicate that concerning Total PD, there are statistically significant differences ($t(501) = 4.284; p = < 0.001$), with younger people showing higher levels ($M = 2.65, SD = 0.82$). As far as Total PTG, there are statistically significant differences ($t(501) = −4.390; p = < 0.001$), with older people showing higher levels ($M = 3.36, SD = 0.84$). As far as Total

PTG, there are statistically significant differences ($t(501) = -4.390; p < 0.001$), with older people showing higher levels ($M = 3.36, SD = 0.84$). No statistically significant differences were found in Total ACEs ($t(501) = 626; p = 0.532$). The results can be found in more detail in Table 5.

Table 6 describes the average levels of the 10 items assessing ACEs, including Total ACEs and its domains, the 10 items assessing PD including Total PD and its subscales—4 for anxiety and 6 for depression—and the 21 items assessing PTG and its factors—11 items for Factor 1, 7 items for Factor 2, and 2 items for Factor 3 by sexual orientation.

Table 6. Prevalence of ACEs, PTG, and PD by sexual orientation.

	Heterosexual (n = 441)		Non Heterosexual (n = 80)		t(df)	p
	M	SD	M	SD		
Emotional abuse	2.15	1.25	2.59	1.40	-2.853 (518)	0.005 *
Physical abuse	1.57	1.03	1.72	1.26	-1.129 (519)	0.259
Sexual abuse	1.36	0.88	1.46	0.94	-0.936 (517)	0.350
Emotional neglect	1.92	1.19	2.47	1.28	-3.768 (518)	<0.001 **
Physical neglect	1.18	0.64	1.30	0.83	-1.397 (518)	0.163
Divorce/parental separation	1.54	1.11	1.69	1.22	-1.090 (519)	0.276
Domestic violence in the household	1.41	0.98	1.52	1.06	-0.871 (519)	0.394
Substance abuse in the household	1.75	1.26	2.00	1.41	1.603 (518)	0.109
Mental illness or suicide of a family member	2.07	1.36	2.59	1.53	-3.134 (519)	0.002 *
Incarceration of a family member	1.25	0.75	1.28	0.84	-409 (516)	0.683
Total ACEs	1.62	0.84	1.86	0.70	-3.298 (519)	0.001 *
Anxiety	2.50	0.83	2.83	0.89	-3.190 (519)	0.002 *
Depression	2.39	0.89	2.89	0.88	-4.593 (519)	<0.001 **
Total PD	2.44	0.89	2.86	0.82	-4.296 (519)	<0.001 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	3.22	0.88	3.03	0.95	1.797 (518)	0.073
PTG Factor 2 (Change in perception of self and in life in general)	3.40	0.91	3.15	0.97	2.248 (519)	0.025 *
PTG Factor 3 (Spiritual Change)	2.96	1.05	2.67	1.15	2.249 (518)	0.025 *
Total PTG	3.21	0.85	2.98	0.82	2.213 (519)	0.027 *

* $p < 0.05$, ** $p < 0.001$.

There were statistically significant differences regarding Total ACEs ($t(519) = -3.298; p < 0.001$), with non-heterosexual people reporting greater levels ($M = 1.86, SD = 0.70$). Also, there were statistically significant differences regarding Total PD ($t(519) = -4.296; p < 0.001$), with non-heterosexual individuals showing higher levels ($M = 2.86, SD = 0.82$). In addition, there were statistically significant differences regarding Total PTG ($t(519) = 2.213; p < 0.05$), with heterosexual individuals reporting higher levels ($M = 3.21, SD = 0.85$). Results can be found in more detail in Table 6.

Table 7 shows the correlations between the following variables: age, Total ACEs, ACEs domains, Total PTG, PTG factors—Factor 1, Factor 2, and Factor 3, and Total PD and its subscales—anxiety and depression. The results show that almost all ACE categories correlate with each other in a significant way ($p < 0.001; p < 0.05$), with emotional abuse and physical abuse showing the strongest correlation ($r = 591$). Also, we observed that Total ACEs showed a positive and strong correlation with depression ($r = 315$). Furthermore, depression showed a stronger correlation with emotional neglect ($r = 0.249$) when compared to other ACE domains. Moreover, depression was strongly correlated with anxiety ($r = 769$). All the correlations can be seen in more detail in Table 7.

Table 7. Results for the correlation values between variables.

	1	2	3	4	5	6	7v	8	9	10	11	12	13	14	15	16	17	18	19	
1—Age	-																			
2—Emotional abuse	−0.042	-																		
3—Physical abuse	0.099 *	0.591 **	-																	
4—Sexual abuse	0.031	0.231 **	0.284 **	-																
5—Emotional neglect	−0.082	0.472 **	0.310 **	0.247 **	-															
6—Physical neglect	0.066	0.228 **	0.279 **	0.236 **	0.291 **	-														
7—Divorce/parental separation	−0.124 **	0.197 **	0.167 **	0.109 *	0.230 **	0.252	-													
8—Domestic violence in the household	−0.029	0.340 **	0.291 **	0.206 **	0.143 **	0.303 **	0.299 **	-												
9—Substance abuse in the household	0.011	0.234 **	0.242 **	0.145 **	0.212 **	0.277 **	0.158 **	0.386 **	-											
10—Mental illness or suicide of a family member	−0.163 **	0.239 **	0.197 **	0.137 **	0.166 **	0.156 **	0.250 **	0.273 **	0.290 **	-										
11—Incarceration of a family member	−0.060	0.190 **	0.234 **	0.055	0.257 **	0.231 **	0.126 **	0.257 **	0.278 **	*0.181 **	-									
12—Total ACEs	−0.067	0.688 **	0.639 **	0.445 **	0.604 **	0.501 **	0.491 **	0.611 **	0.591 **	0.560 **	0.455 **	-								
13—Anxiety	−0.220 **	0.145 **	0.084	0.121 **	0.135 *	0.065	0.093 *	0.081	0.013 **	0.193	0.071	0.179 **	-							
14—Depression	−0.174 **	0.187 **	0.118 **	0.091 *	0.249 **	0.083	0.111 *	0.094 *	0.019	0.172 **	0.078	0.222 ***	0.769 **	-						
15—Total PD	−0.203 **	0.181 **	0.111 *	0.109 *	0.217 **	0.080	0.110 *	0.094 *	0.007	0.191 **	0.080	0.218 **	0.909 **	0.966 **	-					
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	0.117 **	−0.123 **	−0.021	−0.056	−0.154 **	0.019	0.032	0.018	0.041	0.045	−0.116 **	−0.052	−0.051	−0.143 **	−0.114	-				
PTG Factor 2 (Change in perception of self and in life in general)	0.118 *	−0.084	0.009	−0.006	−0.111 *	0.035	0.042	0.064	0.095*	0.067	−0.097 *	0.007	−0.131 **	−0.202 **	−0.185 **	0.844 *	-			
PTG Factor 3 (Spiritual Change)	0.195 **	−0.150 **	−0.049	−0.062	−0.154 **	0.057	0.020	0.002	0.047	−0.031	−0.088 *	−0.077	−0.019	−0.107 *	−0.077	0.795 **	0.678 **	-		
19—Total PTG	0.139 **	−0.110 *	−0.008	−0.032	−0.147 **	0.040	0.044	0.046	0.066	0.048	−0.111 *	−0.027	−0.076	−0.159 **	−0.135 **	0.969 **	0.935 **	0.818 **	-	

* $p < 0.05$, ** $p < 0.001$ (Gignac and Szodorai 2016).

To assess the contribution of sociodemographic variables, Total ACEs, and PTG factors on Total PD, a hierarchical multiple linear regression was conducted (see Table 8). The third model, where the three factors relating to PTG were added, increased the variance from 16.8% to 20.6%, which highlights the importance of PTG in the decrease in PD. Out of the three PTG factors, factor 2 was the strongest predictor of a lower perceived Total PD ($\beta = -0.337$; $p < 0.001$). The results can be seen in more detail in Table 8.

Table 8. Hierarchical multiple linear regression models.

	B	Model 1 SE B	β	B	Model 2 SE B	β	B	Model 3 SE B	β
Age	0.001	004	0.019	0.002	0.004	0.023	0.001	0.001	0.011
Gender	-0.295	0.067	0.185 **	-0.271	0.066	-0.170 **	-0.241	-276	-0.172 **
Marital status	-0.074	0.038	-0.104 *	-0.083	0.037	-0.117 *	-0.073	-073	-0.102 *
Education	0.006	034	0.008	00.08	0.034	0.010	0.020	0.012	0.015
Place of residence	0.045	033	0.058	0.051	0.033	0.066	0.031	0.037	0.047
Socioeconomic status	-0.186	0.049	-0.161 **	-0.171	0.048	-0.148 **	-0.166	-0.159	-0.138 **
Sexual orientation	0.299	0.099	0.131 *	0.246	0.098	0.108 *	0.199	0.222	0.097 *
Professional status	-0.115	0.031	-0.193 **	-0.108	0.031	-0.181 **	-0.095	-0.103	-0.173 **
Total ACEs				0.220	0.057	0.162 **	0.246	0.056	0.181 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)							0.131	0.084	0.142
PTG Factor 2 (Change in perception of self and in life in general)							-0.304	0.068	-0.337 **
PTG Factor 3 (Spiritual Change)							0.084	0.052	109
R ²		0.143			0.168			0.206	
F for change in R ²		100.547 **			110.322 **			100.899	

* $p < 0.05$, ** $p < 0.001$.

To determine whether the relationship between Total ACEs and Total PD is mediated by Total PTG, the computer software by Hayes (2012) was used. Regarding Total ACEs direct effect on Total PD, we observed that Total ACEs are a positive and significant predictor of Total PD ($\beta = 0.293$, $SE = 0.058$, $p < 0.001$). The results can be seen in more detail in Table 9. The simple mediation model for PTG in the form of a statistics diagram can be seen in more detail in Figure 1.

Table 9. Model coefficients for PTG.

Antecedent		M (Total PTG)			Consequent			Y (Total PD)
		Coeff.	SE	p	c'	Coeff.	SE	
X (Total ACEs)	a	-0.038	0.062	0.540	c'	0.293	0.058	<0.001
M (Total PTG)					b	-0.125	0.041	<0.05
constant	i _M	3.242	0.109	<0.001	i _Y	2.415	0.168	<0.001
		R ² = 0.001			R ² = 0.064			
		F(1.521) = 0.377, p = 0.540			F(2.520) = 17.772, p < 0.001			

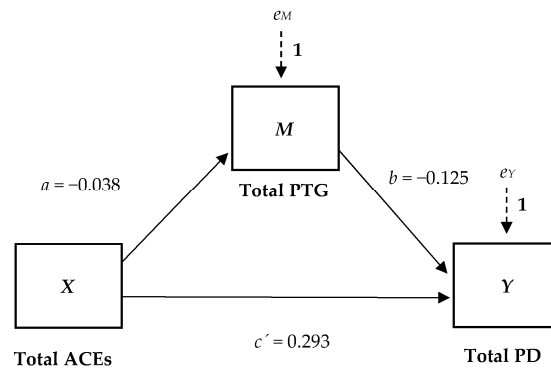


Figure 1. A simple mediation model for PTG in the form of a statistics diagram.

Table 10 shows the Total Effect and the Indirect Effect of Total ACEs on Total PD. With the inclusion of the mediator, the indirect effect of Total ACEs on Total PD ($ab = -0.038 (-0.125) = 0.005$) is not statistically different from zero, as evidenced by a confidence interval that is not entirely above zero (-0.012 to 0.023), meaning that Total PTG does not mediate the relationship between Total ACEs and Total PD.

Table 10. Total and indirect effects of ACEs on PD.

Effect	Path	b	SE	95% CI		t	p
				BootLLCI	BootULCI		
Total	Total ACEs→ Total PD	0.298	0.059	0.183	0.413	5.087	<0.001
Indirect	Total ACEs→ Total PTG→ Total PD	0.005	0.009	-0.012	0.023		

4. Discussion

The main purpose of this study was to assess the impact of ACEs on PD and PTG, as well as to determine the mediating effect of PTG on the relationship between ACEs and PD and to explore the mutual influence of these variables in a sample of adults.

The results show a high prevalence of ACEs ranging from 10.8% (physical neglect) to 59.7% (emotional abuse), with emotional abuse being the most reported category of ACEs. These results are like those found by other studies (Silva and Maia 2008; Silveira and Pereira 2023; Riedl et al. 2020), which suggest that ACEs represent an alarming phenomenon with a significant impact in various cultural contexts. These findings can be associated with the relationship between ACEs and some risk factors that may influence parenting practices, including high parental stress related especially to lower-income situations (Crouch et al. 2019), the lack of parenting skills such as little knowledge about child development (Stith et al. 2009), and the repetition of dysfunctional family patterns, where parents who experienced ACEs in their childhood may be more likely to expose their children to the same experiences (Schickedanz et al. 2021).

As far as Total PD, anxiety and depression are concerned, since the sample is not a clinical sample but a community sample and was not collected probabilistically, the absence of clinical traits was to be expected. Nevertheless, it has been found that Total ACEs are an indicator of the occurrence of Total PD symptomatology in the future (Jones et al. 2022; Thai et al. 2020). The relationship between the occurrence of ACEs and PD can be attributed to how ACEs can create situations of lack of acceptance and support, and in the face of adversity, people react in different ways. For some people, these experiences can result in long-term effects such as feelings of little validation and/or importance, reacting based on response models that are based on depression or anxiety symptoms (Watt et al. 2019), which can be crystallized and maintained over time.

No significant levels of Total PTG were observed. This topic has been the subject of some controversy in the literature (Infurna and Jayawickreme 2019; Jayawickreme and Blackie 2014) regarding the transformative role of adverse experiences in people’s growth

(Tedeschi and Calhoun 2004). Some studies show reports of PTG following different traumas (Jin et al. 2014; Stein et al. 2018) and exposure to ACEs (Woodward and Joseph 2003; Schaefer et al. 2018). Research shows that early intervention reinforces protective factors among young individuals who experience sexual and physical childhood victimization (Schaefer et al. 2018) and that childhood abuse can lead to changes associated with philosophical approaches to life, to the self, and within relationships (Woodward and Joseph 2003). However, the perception of positive psychological changes following adverse experiences may be based on retrospective evaluations of growth perceived by the individual (Infurna and Jajawickreme 2019), dysfunctional reality distortions, coping strategies, and personality characteristics (Tennen and Affleck 2009). This raises the possibility that reports of PTG might be illusory (Boerner et al. 2017).

There were significant differences between groups, and concerning gender, women were found to have more Total ACEs (AlHemyari et al. 2022; Campbell et al. 2016; Giano et al. 2020; Felitti et al. 1998; Soares et al. 2016; Wong et al. 2019) and more Total PD (Agbaje et al. 2021; Matud et al. 2014). Women also reported higher levels of PTG; however, it was not statistically significant. Regarding ACEs domains, women reported more emotional abuse, more sexual abuse (Martin et al. 2022), emotional neglect (Soares et al. 2016), and more mental illness or suicide of a family member when compared to men. As far as PD, women reported more Total PD (Pereira et al. 2019), anxiety, and depression than men. According to Almuneeff et al. (2017), an increased reporting of ACEs is linked to a high prevalence of psychological and mental disorders such as depression and anxiety in women. These findings can be supported by the idea that, as women experience more ACEs, they consequently experience more PD. Concerning Total PTG (even though there were no statistically significant differences regarding gender in this study) previous studies found that women show higher levels of PTG when compared to men (Tedeschi and Calhoun 1996; Vishnevsky et al. 2010), which can be related to the possibility that women tend to perceive a situation as a threat more often and rate events as more stressful (Olf et al. 2007), as a consequence leading to a more significant disruption of their assumptive world, creating conditions for greater reports of PTG (Calhoun and Tedeschi 2006). In addition, due to gender roles, women may be expected to share these experiences and to speak up about their mental health, as well as to seek psychological support (Nam et al. 2010). Moreover, women may have greater access to resources and sources of support that allow them to experience more PTG.

As for the differences between age groups, no significant statistical differences were found concerning Total ACEs, unlike previous research where there was a higher incidence of ACEs in younger people compared to older people (Campbell et al. 2016; Felitti et al. 1998; Nevárez-Mendoza and Ochoa-Meza 2022; Riedl et al. 2020). As far as ACEs domains, younger people reported more divorce or parental separation and mental illness or suicide of a family member, while older people reported more physical abuse and physical neglect (Novais et al. 2021; Riedl et al. 2020). Regarding PD, younger people reported more Total PD, anxiety, and depression, contrasting with the study findings of Pereira and colleagues (2019) in a Portuguese sample. However, previous research shows that younger adults report more psychological distress when compared to older adults (Best et al. 2023) and that younger age groups are more vulnerable to anxiety and depressive symptoms (Varma et al. 2021). Regarding PTG, findings show that older people report higher levels of Total PTG (e.g., greater openness to new possibilities and greater involvement in interpersonal relationships, as well as change in perception of the self and life, in general). These results may be linked to differences in the way they view past events (since there is more temporal spacing between older individuals and the occurrence of ACEs), which may underlie an interference in the memory process and the existence of a cognitive bias (Tennen and Affleck 2009). In addition, older individuals tend to acquire skills throughout their lives that are representative of protective factors that allow them to face difficulties such as resilience and coping strategies (Hoogland et al. 2019), leaving more room for PTG. Simultaneously, the fact that younger people present less Total PTG may mean that they have not yet had

enough time or acquired the resilience to go through a process of integrating negative experiences into their identity.

Sexual minorities presented increased levels of Total ACEs and Total PD compared to heterosexual individuals (Andersen and Blosnich 2013; Ueno 2005), who showed higher levels of PTG. As for the ACE domains, sexual minorities reported more emotional and physical abuse (Balsam et al. 2005), emotional neglect, and mental illness or suicide of a family member. These results could be associated with manifestations or indicators of sexual orientation at an early age that resulted in exposure to adverse experiences. Regarding Total PD, depression, and anxiety subscales, sexual minorities reported greater levels when compared to their heterosexual counterparts. A study by McCabe et al. (2022) showed that sexual minorities are more exposed to ACEs presenting a higher risk of mental health disorders, and research by McLaughlin et al. (2012) revealed that gay or lesbian and bisexual individuals showed higher levels of psychopathology. These results may be related to adolescence (and the identity issues inherent to this life period), social stigma, lack of family support, and pressure to hide sexual minority status (Almeida et al. 2009; Hatzenbuehler 2011; Frost et al. 2007; Mimiaga et al. 2015), as well as the anticipation of rejection that can lead to isolation and low self-esteem (Hetrick and Martin 1987; Wyss 2004). Thus, these disparities seem to be associated with greater exposure to stress-inducing social experiences in a socially marginalized group (Hatzenbuehler et al. 2009; Meyer 1995), meaning that social contexts that perpetuate stigma against sexual minority groups jeopardize their mental health (Almeida et al. 2009; Hatzenbuehler 2011; Meyer 2003). Regarding Total PTG, sexual minorities presented lower levels than heterosexual individuals (who reported greater openness to new possibilities and greater involvement in interpersonal relationships, change in perception of the self and life in general, and spiritual change). This may be associated with risk factors that can hinder post-traumatic-growth for sexual minorities (Counselman-Carpenter and Redcay 2018) such as the fear of discrimination (McNair and Bush 2016) and internalized sexual stigma (Martínez et al. 2022) that may lead to not sharing adverse experiences and not seeking psychological support (Crockett et al. 2022). Moreover, the lack of social support can hinder the development of resilience, which is considered one of the most important factors in PTG development (Abraham et al. 2018; Poteat et al. 2016).

It is important to mention the need for greater investment in research in the future.

Significant, positive correlations were found between the different categories of ACEs (e.g., positive strong correlations between physical and emotional abuse, as well as a positive strong correlation between domestic violence in the household and substance abuse in the household) (Silveira and Pereira 2023), suggesting that they are multidimensional and influence each other, not occurring in an isolated way (Karatekin 2017; Soares et al. 2016; Riedl et al. 2020), which is expected. Also, emotional abuse has a stronger correlation with depression (compared to anxiety), as evidenced in the recent literature (Elmore and Crouch 2020), showing that exposure to emotional abuse is positively associated with psychopathology in adults, especially with mood disorders (Martins et al. 2014).

A significant, positive, and strong correlation was found between depression and anxiety (Lou et al. 2012). Despite being seen as two distinct conditions, they can co-exist in the same person. This can result in more severe symptoms, less effective treatment, and worse prognostics (Gorman 1996).

There was also a significant, negative, and weak correlation between Total PD and Total PTG, and these results are like those found in the literature (Liu et al. 2014). One explanation for the low coefficient could be the existence of moderators between variables such as personality and coping strategies (Liu et al. 2014). Previous studies indicate that people with different personality traits tend to have different ways of coping with stress and upsetting emotions (Dombeck and Wells-Moran 2006), and the type of coping influences the development of PTG (Yeung et al. 2016).

Furthermore, a non-significant, negative, and weak correlation was found between Total ACEs and Total PTG (meaning that the more ACEs, the less positive psychological

changes), which is in line with some previous studies (Widyorini et al. 2022), but not with others (Mohr and Rosén 2017). Such discrepancies may be related to some sample collection conditions, such as sociodemographic aspects, the individual impact of the trauma associated with the subject's characteristics such as extroversion and openness to the experience (Tedeschi and Calhoun 1996), and extrinsic aspects such as social support (Nolen-Hoeksema and Davis 1999). There is a need for greater investment in research in the future.

Factor 2 of PTG, "Change in perception of self and life in general", proved to be the biggest predictor of less perceived psychological distress, (since it increased the variance of the respective construct from 17% to 21%), which may suggest that after facing adverse experiences, people seem to value life more, trust themselves more, and have the ability to cope with complicated situations, perceiving some benefits when facing trauma (Calhoun and Tedeschi 2006).

Lastly, regarding the mediation model, it was found that Total ACEs have a direct and positive relationship with Total PD, which means that the more ACEs, the more PD symptomatology (as previously discussed). As for the mediating effect of Total PTG, there were no significant indicators, that is, post-traumatic growth did not prove to be a mediator of the relationship between Total ACEs and Total PD symptoms in adulthood. These findings may be linked to the possibility that PTG is not sufficiently reparative of the negative impact of ACEs in terms of minimizing PD and that therapeutic approaches are needed to help individuals repair their trauma. Furthermore, reports of PTG can be illusory and not reflect real positive psychological changes. For example, a person faced with changes following a trauma (which may be considered unacceptable to them or their social environment) may use a neurotic defense mechanism to transform negative emotions into gains, and by that, the emotion of loss is absent and not integrated. In this sense, reports of PTG may be rooted in maladaptive defensive processes that enable the person to avoid pain (Boerner et al. 2017). Moreover, PTG may be an insufficient measure to capture the complexity of the phenomenon and future measures need to be studied.

4.1. Limitations

Despite its contributions, this study presents some limitations such as the fact that the sample was collected via an online survey, which limited people's access to it since it could only be filled in by those with access to the internet and an electronic device (such as a cell phone, computer or tablet). Since the sample was collected for convenience, there was a snowball effect, with more Caucasian, female, and heterosexual people participating, so this study cannot be generalized and is not representative of the population studied. In addition, collecting data through a questionnaire can lead to the social desirability effect, and since ACEs were reported retrospectively, participants may suffer from memory lapses and/or bias. In addition, the Portuguese Version of the Family ACE Questionnaire and the Post-Traumatic Growth Inventory for the Portuguese Population (CPTI) contain questions that could act as a trigger for previous traumas and adverse experiences. At the same time, the quantitative nature of the study means that it is not possible to gain an in-depth and complex understanding of the emotional aspects and nuances of the sample, and the cross-sectional nature makes it unable to monitor changes over time and establish a causal relationship between ACEs, PD, and PTG, which is why more mixed, qualitative, and longitudinal investigations are suggested. Finally, the lack of prior research regarding the mediation effect of PTG on the relationship between ACEs and PD makes it more complicated to compare our results with other studies.

4.2. Implications

As for the implications of the present study, the findings suggest that Total ACEs are prevalent and that ACE categories do not occur independently. An explanation for this would be that exposure to one ACE can increase the vulnerability of experiencing more. This can lead to cumulative ACEs, making the recovery process more challenging. Thus,

the results suggest the existence of a relationship between ACEs and mental health, with Total ACEs having a positive direct relationship with Total PD. Moreover, depression and anxiety seem to occur, which may contribute to a worse prognosis. Furthermore, PTG did not mediate the impact of ACEs on Total PD. This information is central to clinical practice and health professionals, particularly those who work with trauma and adversity. In this regard, it is important to create rigorous and appropriate assessment methods concerning ACEs and PD, reminding practitioners that if anxiety or depression is present, the other disorder should be also assessed. In addition, rigorous and adequate intervention methods should be developed to mitigate ACEs' negative consequences on mental health and promote positive psychological changes. Moreover, the findings of this study contribute to the regulation of mental health policies through actions of promotion, prevention, and intervention with children and adolescents and their social contexts like their families and communities. This would ensure the existence of resources and access to psychological care and early interventions, providing a protective environment for children and young people, promoting protective factors and simultaneously reducing risk factors.

4.3. Conclusions

The findings of this study show that ACEs are prevalent and have a direct positive relationship with PD. It was also found that the PTG factor "Change in perception of self and life in general" was the strongest predictor of less perceived Total PD. Moreover, PTG did not mediate the relationship between ACEs and PD and, therefore, did not act as a protective factor. The findings of this study highlight the need for a more in-depth understanding of the impact of ACEs on mental health and the improvement of clinical practice and health policies.

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Informed Consent Statement: All subjects gave their informed consent for inclusion before they participated in the study.

Data Availability Statement: Data available upon request.

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