



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

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Declaração de Integridade

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Sara Isabel Pousadas Caetano

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Resumo Alargado

As Experiências Adversas na Infância (EAI) são acontecimentos stressantes de natureza traumática que ocorrem nos primeiros 18 anos de vida de um indivíduo que contribuem para a ausência de relações familiares seguras e estáveis (APA 2023). As EAI não só causam um impacto negativo na altura em que ocorrem mas também mais tarde, contribuindo para dificuldades psicossociais, comportamentos de risco, bem como para problemas de saúde física e psicológica, na vida adulta. Deste modo, a exposição às EAI tem repercursões imediatas ao nível individual e familiar, mas também a longo prazo, prejudicando o desenvolvimento adaptativo das crianças e jovens. Neste sentido, tem-se constatado um investimento no conhecimento teórico das EAI nos últimos anos, que se traduz no aumento do reconhecimento atribuído à relevância desta linha temática (Struck et al., 2021).

Literatura recente tem vindo a demonstrar uma associação entre as EAI e saúde mental, particularmente o seu impacto no *distress* psicológico (DP). O DP assenta em sofrimento emocional manifestado através de stress, sintomatologia depressiva, ansiógena e somática (Agbaje et al., 2021). Esta sintomatologia é usualmente acompanhada por sentimentos de tristeza, baixa auto-estima (Agbaje et al., 2021), cansaço, tristeza, infelicidade, perda de interesse, tensão e agitação (Belay et al., 2021).

No entanto, alguns autores argumentam que após o confronto com experiências de vida adversas ou circunstâncias de vida complicadas, é possível que os indivíduos experienciem crescimento pós-traumático (CPT) que se traduz na ocorrência de mudanças psicológicas positivas assentes em três dimensões: (1) Maior abertura para novas possibilidades e maior envolvimento em relações interpessoais, (2) Mudança na perceção do self e da vida em geral e (3) Mudança Espiritual (Resende et al., 2008). Estas mudanças psicológicas ocorrem a partir da assimilação e acomodação do contraste provocado pelas EAI, mediante o reestabelecimento das perceções que os sujeitos têm acerca de si mesmos e do mundo (Quan et al., 2022). Com o passar do tempo, as pessoas reconstroem as suas crenças e superam os seus níveis de funcionamento anteriores, percecionando benefícios comparativamente aos seus modos de funcionamento prévios ao confronto com a adversidade (Tedeschi & Calhoun, 1996).

Tendo em consideração as repercursões negativas e significativas a longo prazo das EAI na saúde mental, esta dissertação apresentada em formato de artigo científico procurou, através do estudo desenvolvido, avaliar o impacto das EAI no DP e no CPT, determinar o

efeito mediador do CPT entre as EAI e o DP, bem como explorar a influência mútua destas variáveis numa amostra de adultos, em Portugal, dada a escassez de investigações sobre este tópico. A recolha de dados foi realizada via online, através de um site construído para o efeito, entre setembro e novembro de 2023. Os instrumentos utilizados foram um questionário sociodemográfico; a Versão Portuguesa do *Family Adverse Childhood Experiences Questionnaire* para avaliar a prevalência de das EAI; a *Kessler Psychological Distress Scale (K10)* para avaliar sintomatologia depressiva e ansiógena e o *Postrumatic Growth Inventory (PTGI)* para a população portuguesa, para avaliar os relatos de CPT. A amostra consiste em 521 participantes com idades compreendidas entre os 18 and 80 anos (média = 31.32, DP = 12.28), dos quais 345 são mulheres (66.2%), 166 são homens (31.9%) e 10 se identificam como “outros” (1.9%).

As EAI mais reportadas foram o abuso emocional (59.7%) e a negligência emocional (52.1%) e quase todas as categorias de EAI se correlacionaram de forma significativa ($p < .001$; $p < 0.05$). As EAI Total e o DP Total apresentaram uma correlação positiva e significativa ($r = .218$) e a depressão e ansiedade apresentaram uma correlação positiva, forte e significativa ($r = .769$). As mulheres e minorias sexuais relataram níveis mais elevados EAI Total e DP Total, enquanto que indivíduos mais velhos e heterossexuais relataram níveis superiores de CPT Total. As EAI Total demonstraram ser preditores positivos e significativos de DP Total ($\beta = .181$; $p = <.001$) e o fator 2 do CPT “Mudança na perceção do self e da vida em geral” foi o maior preditor de uma menor perceção de DP Total ($\beta = -.337$; $p = <.001$). O CPT Total não mediou a relação entre as EAI Total e o DP Total ($-.012$ a $.023$).

Os resultados demonstram que as EAI têm um impacto nos sintomas depressivos e ansiógenos da amostra e que o CPT não é um fator protetor dos impactos negativos a longo prazo das EAI na saúde mental dos indivíduos. Estes resultados alertam os profissionais do campo da saúde mental para a importância do desenvolvimento de intervenções precoces com crianças e adolescentes e de forma a garantir um desenvolvimento ajustado, bem como de intervenções terapêuticas que ajudem os indivíduos a reparar os seus traumas, promovendo e melhorando o bem-estar e a qualidade de vida das populações.

Palavras-chave

EAI; infância; distress psicológico; crescimento pós-traumático; saúde mental.

Abstract

Adverse Childhood Experiences (ACEs) are stressful events of a traumatic nature that occur in the first 18 years of an individual's life (APA, 2023) and can result in physical and mental health struggles throughout the life course. ACEs can lead to psychological distress (PD) that manifests mainly through depressive and anxious symptoms (Ridl et al., 2020; Silveira & Pereira, 2023), resulting in the deterioration of one's psychological well-being. However, according to the literature, individuals may experience positive psychological changes following ACEs, as referred to as PTG (posttraumatic growth), by re-establishing their perceptions about themselves, and perceptions of the outside world (Quan et al. 2022).

Very few studies have examined the relationships between ACEs, PD and PTG, specially on an adult sample in Portugal. Therefore, this Dissertation and the study developed aim to assess impact of ACEs on PD and PTG, to determine the mediating effect of PTG between ACEs and PD, as well as to explore the mutual influence of these variables in an adult sample, in Portugal. This study used an online survey that included a sociodemographic questionnaire, The Portuguese-language version of the Family Adverse Childhood Experiences Questionnaire to assess the report of ACEs; The Kessler Psychological Distress Scale (K10) to assess depressive and anxious symptomatology and The Posttraumatic Growth Inventory for the Portuguese Population to assess the report of PTG. The sample consists of 521 participants aged between 18 and 80 years (mean = 31.32, SD = 12.28).

Emotional abuse was the most reported ACE (59.7%) and women and sexual minorities presented more Total ACEs and Total PD, while older and heterosexual people showed more PTG. Total ACEs were positive and significant predictors of Total PD. Factor 2 of PTG "Change in the Perception of the Self and Life in General" was the strongest predictor of a lower perceived psychological distress. Total PTG did not mediate the relationship between Total ACEs and Total PD.

The results demonstrate that PTG is not a protective factor against the long-term impact of ACEs on mental health. Therefore, it's crucial to alert professionals to early mental health interventions with children, adolescents and families to ensure an adjusted

development as well as therapeutic approaches to help individuals repair their trauma, thus promoting and improving the well-being and quality of life of populations.

Keywords

ACEs; childhood; psychological distress; posttraumatic growth; mental health.

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List of Acronyms

ACE	Adverse Childhood Experiences
APA	American Psychological Association
CPT	Crescimento Pós-Traumático
DP	Distress Psicológico
EAI	Experiências Adversas na Infância
PD	Psychological Distress
PTG	Posttraumatic growth
WHO	World Health Organization

Introduction

This dissertation is part of the 2nd Cycle of Studies in Clinical and Health Psychology, leading to a Master's degree, by the Faculty of Social and Human Sciences of the University of Beira Interior.

ACEs are stressful events of a traumatic nature that occur in the first 18 years of an individual's life (APA, 2023) and can lead to the disruption of the child's physical and psychological health (Kalmakis & Chandler, 2014). ACEs are often associated with PD in the future (Agbaje et al., 2021; Jones et al., 2022; Manyema et al., 2018; Thai et al., 2020), particularly with depression and anxiety (Ridl et al., 2020; Silveira & Pereira, 2023).

However, some international studies demonstrate that individuals can assimilate and accommodate the contrast generated by the ACEs by re-establishing their perceptions about themselves, and perceptions of the outside world, which results in a positive psychological changes (Quan et al., 2022) that is referred to as PTG. 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).

In this Dissertation, which encompasses two chapters, seeks to explore the relationships between ACEs, PD and PTG responding to the scarcity of studies developed about this specific topic, in Portugal. The first chapter describes the cross-sectional, descriptive, inferential, correlational, predictive, and mediational study developed with the purpose of assessing the impact of ACEs on psychological distress and PTG, to determine the mediating effect of PTG between ACEs and PD, as well as to explore the mutual influence of these variables in an adult sample, in Portugal. This chapter is organized in the format of a scientific article, written in English and in accordance with the standards of the "*Social Sciences*" Journal (CiteScore=2.6; Q2; IF=1.7) consisting of the following sections: **(1)** Introduction, **(2)** Materials and Methods, **(3)** Results, and **(4)** Discussion.

The second chapter consists of a final reflection on the study developed, regarding both the results and implications, as well as the skills acquired in the course of carrying out the dissertation. Lastly, a theoretical appendix was elaborated to explore in greater depth the controversy surrounding the PTG phenomenon.

Chapter 1. The Mediating Effect of Post-Traumatic Growth on the Relationship between Adverse Childhood Experiences and Psychological Distress in Portuguese Adults

This chapter was written according to the following scientific activities:

- Publications:

Caetano, S., & Pereira, H. (2024). The mediating effect of post-traumatic growth on the relationship between adverse childhood experiences and psychological distress in adults. *Social Sciences*, 13(5), 262. <https://doi.org/10.3390/socsci13050262> [IF=1.6; CiteScore=2.7; Q2]

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The Mediating Effects of PTG between ACEs and PD

Abstract

Background: Research on adverse childhood experiences (ACEs) shows that they are one of the most main sources of stress in early life and might result in psychological distress (PD) in adult life. Nevertheless, facing these adversities can lead to post-traumatic growth (PTG). However, few studies have analyzed the mediating effect of PTG in the relationship between ACEs and PD in an adult sample, in Portugal.

Objective: This study aims to assess the impact of ACEs on PD and PTG, to determine the mediating effect of PTG between ACEs and PD, as well as to explore the mutual influence of these variables in an adult sample, in Portugal.

Participants and Setting: The sample consists of 521 participants aged between 18 and 80 years (mean = 31.32, SD = 12.28).

Methods: This study used an online survey that contained a sociodemographic questionnaire, the Family ACE Questionnaire to assess the report of ACEs, the Kessler Psychological Distress Scale (K10) to assess anxiety and depressive symptoms, and the Post-Traumatic Growth Inventory (PTGI) to assess the perception of positive psychological changes after facing adversity.

Results: Emotional abuse was the most reported ACE (59.7%). Women and sexual minorities presented more ACEs and PD, while older and heterosexual people showed more PTG. ACEs were positive and significant predictors of PD. Factor 2 of PTG "Change in the Perception of the Self and Life in General" was the strongest predictor of a lower perceived PD. PTG did not mediate the relationship between ACEs and PD.

Conclusions: PTG did not mediate the relationship between ACEs and PD symptoms in adulthood, and so it did not act as a protective factor against the impact of these experiences on mental health. These findings highlight the need of early mental health interventions with children, adolescents and families to ensure an adjusted development as well as therapeutic approaches to help individuals repair their trauma, thus promoting and improving the well-being and quality of life of populations.

Keywords

ACEs; childhood; psychological distress; posttraumatic growth; mental health.

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 & Blair, 2018; WHO, 2020) and can lead to the disruption of the child's physical and psychological health (Kalmakis & 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 & Larkin, 2013; Felitti et al., 1998; Hales et al., 2023; Manyema et al., 2018; Merrick et al., 2017; Nevárez-Mendoza & Ochoa-Meza, 2022; Soares et al., 2022). The most common types of ACEs are emotional abuse (67–82.9%) (Amaranggani & 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 & 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 & Ochoa-Meza, 2022; Soares et al., 2016).

1.1. Sociodemographic Characteristics 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 & 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 & 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 & Ochoa-Meza, 2022), diabetes (Campbell et al., 2016; Monnat & Chandler, 2015; Novais et al., 2021), heart problems (Felitti et al., 1998; Monnat & Chandler, 2015; Ramiro et al., 2010), and chronic diseases (Boullier & 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 & 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 & 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), 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 & Tedeschi, 1999, p. 11; Jayawickreme et al., 2020; Tedeschi & Calhoun, 1996; Tedeschi & Calhoun, 2004). PTG may occur simultaneously with PD, which is the product of attempts to adapt to adverse events (Tedeschi & Calhoun, 2004). PTG is not about ending suffering (Kaye-Tzadok & 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 & 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).

		n	%
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	.2
	Mixed Race	11	2.1
	Hispanic/Latino	16	3.1
	Asian	2	.4
Nationality	Other	1	.2
	Portuguese	495	95
	Other	26	5
Country of residence	Portugal	501	96.1
	Other	20	3.9
	Small rural area	128	24.6
Place of residence	Large rural area	59	11.3
	Small urban area	232	44.5
	Large urban area	100	19.2
	Other	2	.4
	Lower	31	6
Socioeconomic status	Lower middle	165	31.6
	Middle	281	53.9
	Upper middle	44	8.5

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	Unemployed	9	1.7
	Employed	246	47.2
Professional status	Student	165	31.6
	Student-worker	47	9.1
	Self-employed	49	9.4
	Retired	3	.6
	Other	2	.4
	High school or less	225	43.2
	Bachelor's degree	189	36.3
Education	Master's degree	88	16.9
	Doctorate/Ph.D.	8	1.5
	Other	11	2.1
	Single	168	32.2
	Dating	177	34
Marital status	Married	108	20.7
	De facto union	42	8.1
	Separated/divorced	20	1
	Widower	5	3.8
	Other	1	.2
	Living alone	71	13.6
	Living with another person	104	20
Living situation	Living with two people	157	30.1
	Living with three people	151	29
	Living with four people or more	38	7.3

2.2. Measurement instruments

The questionnaires were selected to gather information according to the variables and goals of the present study. A Sociodemographic Questionnaire was used; 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 & Maia, 2008) was used to assess the report of ACEs and consists of the following domains: emotional abuse, physical abuse, sexual abuse, exposure to

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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 .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 .91. For this study, Cronbach's alpha was calculated for the total scale and the two sub-scales, obtaining results of .94, .93, and .89 for the total scale, depression, and anxiety, respectively. Thus, the instrument showed good internal consistency.

The Posttraumatic Growth Inventory for the Portuguese Population (Resende et al. 2008), adapted from the original version of the Posttraumatic 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 Posttraumatic Growth Inventory for the Portuguese Population (Resende et al., 2008) showed an alpha of 0.95 for the total scale, an alpha of .94 for the "Greater openness to new possibilities and greater involvement in interpersonal relationships" factor, an alpha of .84 for the "Change in perception of self and life in general" factor, and finally, an alpha of .64 for the "Spiritual change" factor. In this study, the Cronbach's alpha values for the total scale were 0.96, for the factor "Greater openness to new possibilities and greater involvement in interpersonal relationships" was .93, for the factor "Change in perception of self and life in general" was 0.91, and for the factor "Spiritual change" was .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 $<.05$ 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	n	%
	No	210	40.3
Emotional abuse	Yes	311	59.7
	No	360	69.1
Physical abuse	Yes	161	30.9
	No	420	80.7
Sexual abuse	Yes	101	19.3
	No	250	47.9
Emotional neglect	Yes	271	52.1
	No	465	89.2
Physical neglect	Yes	56	10.8
	No	392	75.2
Divorce/parental separation	Yes	129	24.8
	No	416	79.8
Domestic violence in the household	Yes	105	20.2
	No	344	66
Substance abuse in the household	Yes	177	34
	No	253	48.6
Mental illness or suicide of a family member	Yes	268	51.4
	No	452	86.7
Incarceration of a family member	Yes	69	13.3
	No	0	
Total ACEs	Yes	521	100%

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Table 3 shows the descriptive statistics for Total ACEs and ACE domains, Total PTG and its factors— 11 items for Factor 1, 7 items for Factor 2, and 2 items for Factor 3, — as well as of PD and its respective subscales—4 items for anxiety and 6 items for depression. In the general sample, the mean of Total ACEs is 1.66 (SD = .61) with a sum of 16.56, the mean of Total PTG is 3.18 (SD = .86) with a sum of 66.34, and the mean of Total PD is 2.51 (SD = .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	.61	16.56
Emotional abuse	2.23	1.28	2.23
Physical abuse	1.59	1.07	1.59
Sexual abuse	1.37	.89	1.37
Emotional neglect	2.01	1.22	2.01
Physical neglect	1.20	.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	.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	.90	34.93
PTG Factor 2 (Change in perception of self and in life in general)	3.36	.93	23.40
PTG Factor 3 (Spiritual Change)	2.92	1.07	5.20
Total PD	2.51	.83	25.03
Anxiety	2.56	.84	10.20
Depression	2.47	.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 gender.

Statistically significant differences were found in Total ACEs ($t(511) = 3.321$; $p < .001$), with women scoring higher when compared to men ($M = 1.71$, $SD = .62$). Concerning Total PD, we also found statistically significant differences ($t(511) = 5.356$; $p < .001$), with women also reporting greater scores ($M = 2.62$, $SD = .83$). No statistically significant

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differences were found in Total PTG ($t(511) = 1.831; p = .068$). The results can be found in more detail in Table 4.

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)	.011 **
Physical abuse	1.60	1.1	1.56	1.03	389 (511)	.698
Sexual abuse	1.48	1	1.13	.51	4.355 (509)	<.001 **
Emotional neglect	2.11	1.28	1.78	1.06	2.881 (510)	.004 **
Physical neglect	1.19	.66	1.21	.66	-.340 (510)	.734
Divorce/parental separation	1.59	1.14	1.45	1	1.385 (511)	.167
Domestic violence in the household	1.46	1.06	1.34	.81	1.308 (511)	.192
Substance abuse in the household	1.80	1.33	1.75	1.17	.404 (510)	.687
Mental illness or suicide of a family member	2.28	1.46	1.80	1.20	3.726 (511)	<.001 **
Incarceration of a family member	1.27	.81	1.21	.57	0.893 (507)	.372
Total ACEs	1.71	.62	1.52	.53	3.321 (511)	<.001 **
Anxiety	2.68	.83	2.25	.78	5.5476 (511)	<.001 **
Depression	2.59	.91	2.19	.82	4.787 (511)	<.001 **
Total PD	2.62	.83	2.21	.75	5.356 (511)	<.001 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	3.34	.85	3.10	.98	1.714 (510)	.087
PTG Factor 2 (Change in perception of self and in life in general)	3.41	.88	3.27	1.02	1.588 (511)	.113
PTG Factor 3 (Spiritual Change)	2.96	1.04	2.84	1.12	1.210 (510)	.227
Total PTG	3.23	.81	3.08	.95	1.831(511)	.068

** $p < .001$.

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.

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 ($M = 2.65, SD = .82$). As far as Total PTG, there are statistically significant differences ($t(501) = -4.390; p = < .001$), with older people showing higher levels ($M = 3.36, SD = .84$). No statistically

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significant differences were found in Total ACEs ($t(501) = 626; p = .532$). The results can be found in more detail in Table 5.

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		
Physical abuse	1.48	.97	1.68	1.14	-2.060(501)	.040 *
Sexual abuse	1.32	.78	1.42	.98	-1.264 (499)	.207
Emotional neglect	2.09	1.23	1.90	1.21	1.753(500)	.080
Physical neglect	1.13	.55	1.26	.77	-2.183 (500)	.029 *
Divorce/parental separation	1.69	1.22	1.41	.98	2.819(501)	.005 *
Domestic violence in the household	1.40	.96	1.46	1.02	-.623 (501)	.534
Substance abuse in the household	1.75	1.24	1.84	1.34	-.778 (500)	.437
Mental illness or suicide of a family member	2.30	1.48	1.96	1.26	2.701(501)	.007 *
Incarceration of a family member	1.26	.73	1.22	.73	.559 (497)	.577
Total ACEs	1.67	.60	1.53	.59	.626 (501)	.532
Anxiety	2.72	.85	2.37	.78	4.716 (501)	<.001 **
Depression	2.61	.90	2.32	.89	3.632 (501)	<.001 **
Total PD	2.65	.82	2.33	.80	4.284(501)	<.001 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	3.06	.90	3.36	.86	-3.884(500)	<.001 **
PTG Factor 2 (Change in perception of self and in life in general)	3.22	.93	3.53	.89	-3.873(501)	<.001 **
PTG Factor 3 (Spiritual Change)	2.72	1.05	3.18	1.04	-4.905(500)	<.001 **
Total PTG	3.03	.84	3.36	.84	-4.390 (501)	<.001 **

* $p < .05$

** $p < .001$.

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.

There were statistically significant differences regarding Total ACEs ($t(519) = -3.298; p = < 0.001$), with non-heterosexual people reporting greater levels ($M = 1.86, SD = .70$).

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Also, there were statistically significant differences regarding Total PD ($t(519) = -4.296$; $p < .001$), with non-heterosexual individuals showing higher levels ($M = 2.86$, $SD = .82$). In addition, there were statistically significant differences regarding Total PTG ($t(519) = 2.213$; $p < .05$), with heterosexual individuals reporting higher levels ($M = 3.21$, $SD = .85$). Results can be found in more detail in Table 6.

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		
Physical abuse	1.57	1.03	1.72	1.26	-1.129519	.259
Sexual abuse	1.36	.88	1.46	.94	-.936(517)	.350
Emotional neglect	1.92	1.19	2.47	1.28	-3.768 (518)	<.001 **
Physical neglect	1.18	.64	1.30	.83	-1.397 (518)	.163
Divorce/parental separation	1.54	1.11	1.69	1.22	-1.090 (519)	.276
Domestic violence in the household	1.41	.98	1.52	1.06	-.871 (519)	.394
Substance abuse in the household	1.75	1.26	2.00	1.41	1.603 (518)	.109
Mental illness or suicide of a family member	2.07	1.36	2.59	1.53	-3.134 (519)	.002 *
Incarceration of a family member	1.25	.725	1.28	.84	-409 (516)	.683
Total ACEs	1.62	.84	1.86	.70	-3.298(519)	.001 *
Anxiety	2.50	.83	2.83	.89	-3.190 (519)	.002 *
Depression	2.39	.89	2.89	.88	-4.593 (519)	<.001 **
Total PD	2.44	.89	2.86	.82	-4.296 (519)	<.001 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	3.22	.88	3.03	.95	1.797 (518)	.073
PTG Factor 2 (Change in perception of self and in life in general)	3.40	.91	3.15	.97	2.248(519)	.025 *
PTG Factor 3 (Spiritual Change)	2.96	1.05	2.67	1.15	2.249(518)	.025 *
Total PTG	3.21	.85	2.98	.82	2.213(519)	.027 *

* $p < .05$

** $p < .001$.

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 ($p < .001$; $p < .05$), with emotional abuse and physical abuse showing the strongest correlation ($r = .591$). Furthermore, depression showed a stronger correlation with emotional neglect ($r = .249$) 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.

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Table 7. Results for correlation values among variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1—Age	-																			
2—Emotional abuse	-.042	-																		
3—Physical abuse	.099 *	.591 **	-																	
4—Sexual abuse	.031	.231 **	.284 **	-																
5—Emotional neglect	-.082	.472 **	.310 **	.247 **	-															
6—Physical neglect	.066	.228 **	.279 **	.236 **	.291 **	-														
7—Divorce/parental separation	-.124 **	.197 **	.167 **	.109 *	.230 **	.252	-													
8—Domestic violence in the household	-.029	.340 **	.291 **	.206 **	.143 **	.303 **	.299 **	-												
9—Substance abuse in the household	.011	.234 **	.242 **	.145 **	.212 **	.277 **	.158 **	.386 **	-											
10—Mental illness or suicide of a family member	-0.163 **	.239 **	.197 **	.137 **	.166 **	.156 **	.250 **	.273 **	.290 **	-										
11—Incarceration of a family member	-.060	.190 **	.234 **	.055	.257 **	.231 **	.126 **	.257 **	.278 **	.181 **	-									
12—Total ACEs	-.067	.688 **	.639 **	.445 **	.604 **	.501 **	.491 **	.611 **	.591 **	.560 **	.455 **	-								
13—Anxiety	-.220 **	.145 **	.084	.121 **	.135*	.065	.093*	.081	.013 **	.193	.071	.179 **	-							
14- Depression	-.174 **	.187 **	.118 **	.091*	.249 **	.083	.111*	.094*	.019	.172 **	.078	.222 ***	.769 **	-						
15 – Total PD	-.203 **	.181 **	.111*	.109*	.217 **	.080	.110*	.094*	.007	.191 **	.080	.218 **	.909 **	.966 **	-					

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16 - PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)	.117 **	-.123 **	-.021	-.056	-.154 **	.019	.032	.018	.041	.045	-.116 **	-.052	-.051	-.143 **	-.114	-			
17 - PTG Factor 2 (Change in perception of self and in life in general)	.118*	-.084	.009	-.006	-.111*	.035	.042	.064	.095*	.067	-.097*	.007	-.131 **	-.202 **	-.185 **	-.185 **			
18 - PTG Factor 3 (Spiritual Change)	.195 **	-.150 **	-.049	-.062	-.154 **	.057	.020	.002	.047	-.031	-.088*	-.077	-.019	-.107*	-.077	-.077	.678 **	-	
19 - Total PTG	.139 **	-.110*	-.008	-.032	-.147 **	.040	.044	.046	.066	.048	-.111*	-.027	-.076	-.159 **	-.135 **	-.135 **	.935 **	.818 **	-

* p < .05

** p < .001.

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 ($\beta = -.337$; $p < .001$). The results can be seen in more detail in Table 8.

Table 8. Hierarchical multiple linear regression models.

	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	SE B	β
Age	.001	.004	.019	.002	.004	.023	.001	.001	.011
Gender	-.295	.067	.185 **	-.271	.066	-.170 **	-.241	.076	-.172 **
Marital status	-.074	.038	-.104 *	-.083	.037	-.117 *	-.073	.073	-.102 *
Education	.006	.034	.008	.08	.034	.010	.020	.012	.015
Place of residence	.045	.033	.058	.051	.033	.066	.031	.037	.047
Socioeconomic status	-.186	.049	-.161 **	-.171	.048	-.148 **	-.166	.059	-.138 **
Sexual orientation	.299	.099	.131 *	.246	.098	.108 *	.199	.222	.097 *
Professional status	-.115	.031	-.193 **	-.108	.031	-.181 **	-.095	.103	-.173 **
Total ACEs				.220	.057	.162 **	.246	.056	.181 **
PTG Factor 1 (Greater openness to new possibilities and greater involvement in interpersonal relationships)							.131	.084	.142
PTG Factor 2 (Change in perception of self and in life in general)							-.304	.068	-.337 **
PTG Factor 3 (Spiritual Change)							.084	.052	.109
R ²		.143			.168			.206	
F for change in R ²		100.547			110.322*			100.899	
		**			*				

* $p < .05$

** $p < .001$.

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 ($\beta = .293$, $SE = .058$, $p < .001$). 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			
		Coeff.	SE	p	Y (Total PD)			
X (Total ACEs)	a	-.038	.062	.540	c'	.293	.058	<.001
M (Total PTG)					b	-.125	.041	<.05
constant	i _M	3.242	.109	<.001	i _Y	2.415	.168	<.001
$R^2 = .001$ $F(1,521) = .377, p = .540$				$R^2 = .064$ $F(2,520) = 17.772, p < .001$				

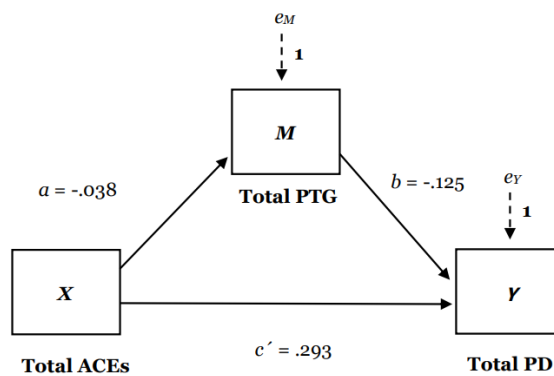


Figure 1. A simple mediation model for PTG in the form of a statistics diagram.

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 ($ab = -.038 (-.125) = .005$) is not statistically different from zero, as evidenced by a confidence interval that is not entirely above zero ($-.012$ to $.023$), meaning that Total PTG does not mediate the relationship between Total ACEs and Total PD.

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

Effect	Path	b	SE	95% CI		t	p
				BootLLCI	BootULCI		
Total	Total ACEs → Total PD	.298	.059	.183	.413	5.087	<.001
Indirect	Total ACEs → Total PTG → Total PD	.005	.009	-.012	.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, in Portugal.

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 & Maia 2008; Silveira & 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 & Jayawickreme, 2019; Jayawickreme & Blackie, 2014) regarding the transformative role of adverse experiences in people's growth (Tedeschi & Calhoun, 2004). Some studies show reports of PTG following different traumas (Jin et al., 2014; Stein et al., 2018) and exposure to ACEs (Woodward & 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 & 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 & Jajawickreme, 2019), dysfunctional reality distortions, coping strategies, and personality characteristics (Tennen & 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 (Viertiö et al., 2021), anxiety, and depression than men. According to Almuneef 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 & 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 & 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 & 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 et al. (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 & 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 & 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 & 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 posttraumatic-growth for sexual minorities (Counselman-Carpenter & Redcay, 2018) such as the fear of discrimination (McNair & 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 & 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 & 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 coexist 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 & 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 & 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 & Calhoun, 1996), and extrinsic aspects such as social support (Nolen-Hoeksema & 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 & 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.

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.

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.

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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Chapter 2. Final Reflection

ACEs can have a profoundly negative impact on the physical and mental health of the children and young people who experience them, and their repercussions can extend into later life. Portuguese studies such Novais et al. (2021) and Pinto et al. (2015) suggest that ACEs are related to anxiety and depressive symptoms – psychological distress - in adulthood. In contrast, some authors suggest that ACEs can lead to positive psychological changes, referred to as posttraumatic growth (Schaefer et al., 2018).

The main objective of this Dissertation was to assess the impact of ACEs on PD and PTG, to determine the mediating effect of PTG between ACEs and PD, as well as to explore the mutual influence of these variables in an adult sample, in Portugal, responding to the limited research developed in this field. Almost all ACEs correlated positively, strongly and significantly with each other meaning that they tend to co-occur, which was expected, since various domains of adversity are frequently experienced (Ridl et al., 2020; Silveira & Pereira, 2023; Soares et al., 2016; Karatekin, 2017). On the other hand, Depression and anxiety correlated strongly, positively and significantly (Lou et al., 2012), alerting for the greater impact of this comorbidity evidenced by severe symptomatology, less effective treatment, and worse prognosis (Gorman, 1996). Factor 2 from PTG “Change in perception of self and life in general” was the biggest predictor of less perceived PD, which may indicate that following ACEs people are more appreciative of their life, have more self-trust and can cope with difficult circumstances (Woodward & Joseph, 2003). However, PTG did not mediate the relationship between ACEs and PD, meaning that either PTG it’s illusory (Boerner et al., 2017) or that it is not sufficiently reparative of the impact of these experiences and individuals may not be able to repair their trauma on their own without professional help.

From these findings, implications can be extrapolated at the level of, prevention, promotion and intervention practices by mental health professionals with children, young people and their social contexts. Also, the development of adequate and rigorous assessment methods and therapeutic interventions it’s crucial to assist adult individuals in minimizing possible negative effects of these experiences such as maladaptive response models of depression and anxiety, helping them repair their trauma.

Measures can also be outlined in terms of political involvement, which should aspire to regulate, through the implementation of childhood, health, education and family laws, an environment that protects children and adolescents, strengthens protective factors and minimizes risk factors.

The development of this dissertation was carried out in accordance with the objectives of EuroPsy – The European Certificate in Psychology (EFPA, 2015), which enabled the acquisition and consolidation of investigation skills, particularly bibliographic skills, data collection and analysis, critical interpretation and discussion of the findings obtained, the comparison of this study results with prior research on the topic, as well as familiarization with ethical principles and procedures inherent to psychological investigation. All information was communicated through scientific writing and published as a scientific article in an international peer-reviewed journal as means to reach a broader audience, and thereby contributing to significant changes that may positively impact the lives of those who experience ACEs and their negative long-term repercussions and struggle to repair the resulting trauma.

Even though investigations on ACEs and PTG have increased in recent years (Boals, 2023; Struck et al., 2021) contributing to the growing awareness about the profound and negative impacts of these experiences on mental health and the likelihood that individuals may not have the needed personal resources to be able to repair their traumas on their own, it is important that future research on ACEs and the phenomenon of PTG is developed to contribute to a psychological practice that is more aligned to reality and people's struggles.

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Appendix

Theoretical Appendix

Given the goals and results of this study, namely the absence of relevant levels of PTG and the fact that PTG did not mediate the relationship between ACEs and PD, it is essential to explore in more detail what the pre-existing literature says about the phenomenon of PTG, namely the controversy over whether it is genuine or illusory.

As first described by Tedeschi & Calhoun (1996), genuine PTG occurs when a person experiences a traumatic event that results in psychological problems associated with a decrease in levels of functioning. Over time, individuals rebuild their assumptions and beliefs, which leads them to reach higher levels of functioning than before the trauma (Boals, 2023). In other words, the term "growth" implies that people experience additional benefits compared to their way of functioning before being confronted with adversity. Thus, individuals not only overcome the trauma experienced, but also achieve improved psychological functioning in certain dimensions. For instance, there tends to be personal development, an increased connection with others or with a higher power, a deepened sense of meaning, and new life priorities (Zoellner & Maercker, 2006).

Nevertheless, following the introduction of the concept of PTG, some concerns arose regarding the veracity of PTG reports (Boals, 2023). For instance, Wu et al. (2019) found that the more than half of the participants reported significant levels of PTG following a traumatic event and that positive responses to those events were higher than negative ones. In addition, Zell et al. (2020) found that trauma related narratives had mostly positive words rather than negative ones. However, previous researches show that traumatic experiences such as ACEs tend to lead to the deterioration of individual's mental health, leading to anxious and depressive symptoms (McKay et al., 2021; Jones et al., 2022; Thai et al., 2020). Such findings demonstrate that being confronted with challenging life circumstances does not make people stronger, but in contrast, increases one's vulnerability (Boals, 2023).

Hence, some authors began to question the high levels of true PTG, as it is not only challenging to regain pre-trauma functioning levels, but even harder to surpass them (Boals, 2023). This would require a very high capacity for psychological strength, the use of coping strategies over time, determination, courage and a strong source of social support (Weststrate et al., 2022). Therefore, Maercker & Zoellner (2004) developed the "Janus-Face Model of PTG", in which they suggest that self-reported PTG involve separate: a genuine side of PTG, as described by the original authors, in which people fully recover

from the trauma and exceed their levels of pre-trauma functioning, and an illusory side of PTG, in which subjects convince themselves that they experienced PTG as a way of coping with the stress caused by traumatic experiences. Similarly, some authors claim that self-reported PTG does not actually reflect genuine PTG, but perceived PTG instead (Boals, 2023; Jayawickreme & Blackie, 2014). According to Boals (2023), it is possible that perceived PTG reflects both real or genuine and illusory PTG, as individuals might go through real psychological growth, but might have an excessive belief as to how much they actually grew.

According to previous literature, there may be a number of reasons behind the over report of PTG. Boals & Schuler (2018) state that one of the reasons is the structure of the instruments, as the PTGI items are positively structured, which implies to the participants that growth must have occurred, and it is a matter of how much they have grown. Another reason could be the coping styles used (Boals, 2023). It is possible that when faced with trauma or adversity, people use defense mechanisms that transform negative emotions into gains, and the emotion of loss is not integrated, avoiding suffering (Boerner, 2017). Prati & Pietrantonio (2009) explain that although people can use adaptive coping mechanisms coping, their positive impact is small. In contrast, people tend to use positive reappraisal which is based on an excessively positive memory bias when recalling stressful experiences (Levine et al., 2012), negative religious coping (Gerber et al., 2011), avoidance coping as well as a denial coping type (Boals & Schuler, 2018; Henson et al., 2021). These coping styles do not correspond to those considered to promote genuine PTG (Boals, 2023), such as reflective processing, which encompasses being open to self-reflection along with efforts to solve, handle and constructively reconstruct oneself in the aftermath of an adverse or traumatic event (Weststrate et al., 2022).

Furthermore, another reason underlying the over-reporting of PTG may be cognitive distortions, since autobiographical memories have little precision about what really happened, but narratives that are always being reconstructed through revisions (McAdamns, 2001; Tennen & Affleck, 2009). Faced with difficult life situations, people feel hope in the old saying "what does not kill you makes you stronger" (Jayawickreme et al., 2021) and, therefore, for suffering and pain to be worth it, they want to believe that pain brings benefits, such as the belief that adversity has been transformed into personal growth (Boals, 2023; Tiberius, 2021).

Moreover, cultural expectations may play a significant role regarding the over report of PTG (Boals, 2023). The cultural and social environment where people are integrated, teaches them how they should respond to trauma (Weststrate et al., 2022). Thus, the

narratives created by people about their own experiences that can underlie implications about their selves are strongly impacted by social contexts (Nelson & Fivush, 2024).

Taking into account the difficulties inherent in evaluating PTG, Boals (2023) argues that in order to evaluate genuine PTG, it is essential to follow four essential steps: (1) evaluate how the person is currently doing, (2) evaluate how the person was prior to the traumatic experience, (3) evaluate changes that occurred and (4) determine whether these transformations are related to PTG. Future research should move away from retrospective measures and instead use present day pre-trauma baseline measuring of potential growth (Boals, 2023) with the aim of assessing what the person is like before the trauma in order to be able to accurately assess subsequent growth. Also, it's crucial to focus on the methodological questions meant for assessing PTG, such as the validity of the participant's responses and if the changes reported manifest through beliefs or actual behavior (Jayawickreme & Blackie, 2014). Furthermore, researches should move on from cross-sectional studies to longitudinal ones, that should be the standard assessment type for PTG (Roedpke et al., 2013). Overall, subsequent investigations should pay attention to the precision and authenticity of PTG measures, as they should seek to create more rigorous assessment measures to better understand possible positive psychological changes following trauma.

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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 NS 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), 2004; 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 2,595 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 (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	.02
	Mixed Race	11	2.1
	Hispanic/Latino	16	3.1
	Asian	2	.4
	Other	1	.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	.4
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	.6
	Other	2	.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	.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

	No	0	
Total ACEs	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.

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 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
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

** $p < 0.001$.

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 ($n = 287$)		Older People ($n = 234$)		$t(df)$	p
	(18–31 years)		(32–80 years)			
	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.

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 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	-1.129519	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	0.725	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 *

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

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 ($r = 0.591$). 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 ($r = 0.769$). 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	.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 **	*.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 **	-	

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

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.

	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	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		Consequent						
		M (Total PTG)			Y (Total PD)			
		Coeff.	SE	p		Coeff.	SE	p
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
		$R^2 = 0.001$				$R^2 = 0.064$ $F(2.520) = 17.772$, $p < 0.001$		
		$F(1.521) = 0.377$, $p = 0.540$				0.001		

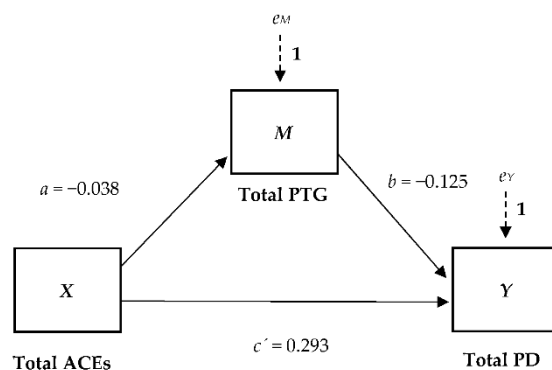


Figure 1. A simple mediation model for PTG in the form of a statistics diagram.

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 ($ab = -0.038 \times -0.125 = 0.005$) 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	0.23		

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 Almuneef 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 (Olff 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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