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RESEARCH ARTICLE

The effect of cumulative trauma and polarised thinking on severity of depressive disorder

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Abstract

Over recent decades, there has been more evidence of the connection between trauma and depression. More research is needed on the relationship between different types of trauma and their combination (cumulative trauma) with respect to the severity of depressive symptoms. The extent to which trauma and cognitive processes that manifest as polarised or 'black and white' thinking affect the severity of depression has yet to be explored.

Objective: The objective of this research was to examine the impact of cumulative trauma and polarised thinking on the severity of depressive symptoms.

Method: In total, 172 patients, mostly women, with a diagnosis of Major Depressive Disorder or Dysthymia (or both) were evaluated using the Cumulative Trauma Scale. The Repertory Grid Technique was used to measure polarised thinking, and the Beck Depression Inventory-II was used to assess the severity of depressive symptoms.

Results: The severity of depressive symptoms was strongly associated with a high level of polarised thinking and a high frequency of perceived negative trauma.

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Conclusions: Our findings underscore the need to address polarised thinking and trauma (when present) as a target of interventions aimed at reducing depression symptoms.

KEYWORDS

cognitive biases, cognitive rigidity, cognitive theory, Personal Construct Theory, polarised cognition, Repertory Grid Technique, stressful life events

INTRODUCTION

Depression, characterised mainly by extreme sadness or/and loss of interest or pleasure, is a major contributor to the global burden of disease worldwide (Liu et al., 2024). The COVID-19 pandemic has exacerbated the presence of these symptoms (COVID-19 Mental Disorders Collaborators, 2021). It is estimated that depression affects 5% of adults in all communities across the world (IHME, 2019), having a greater impact on women (Lim et al., 2018).

Traumatic experiences profoundly impact human psychological development during childhood and throughout life (e.g. Edwards et al., 2003; Kleber, 2019). In fact, depression is a common problem arising in people with a history of trauma. Several studies have pointed out that early childhood traumatic experiences, such as emotional and sexual abuse and emotional neglect, are strongly associated with long-term depressive symptoms in adulthood (Alnassar et al., 2024; Anda et al., 2002; Humphreys et al., 2020; Mandelli et al., 2015). In real life, traumatic experiences usually co-occur with other forms of abuse, which amplify their detrimental effects on mental health, forming what is conceptualised as *cumulative trauma* experiences (Scott-Storey, 2011). The term has been proposed to expand the concept of trauma to encompass significant events or sequences of stressful events across the lifespan, not only threatening physical integrity but also personal and social identity (Kira, 2021a). Kira (2021b) has proposed the Development-Based Trauma Framework (DBTF) that identifies seven major trauma types: attachment (e.g. early abandonment by one or both parents), personal identity (e.g. childhood maltreatment), collective identity (e.g. racism), role identity (e.g. unemployment or chronic school failures), survival (e.g. car accident), secondary traumas (e.g. witnessing domestic abuse) and gender discrimination (e.g. threatened because of gender). All of these trauma types have been linked to depressive symptomatology (Kira, 2021b).

Furthermore, traumatic events are considered a part of a global model of stress dynamics, interacting with acute and chronic stressors. For instance, recent evidence pointed out that attachment trauma impacts other traumas that proliferate across one's life (Kira, 2021b; Kira et al., 2020). In this comprehensive approach, DBTF includes cumulative appraisals of traumatic events. Negative appraisals have been associated with poor mental health profiles, and positive appraisals have been linked to improved mental health (Kira et al., 2014; Kira, Shuwiekh, et al., 2019). Other studies have found that negative appraisal experiences have significant effects on psychopathology (Moya-Higueras et al., 2020; Sarason et al., 1978). However, we still know relatively little about the role of cognitive factors on the impact of cumulative trauma experiences on depression.

Beck's (1976) cognitive model is one of the most recognised explanations of depression. Cognitive biases have since been regarded as one of the bases of depressive symptomatology (e.g. Beck & Bredemeier, 2016). One such distortion is dichotomous thinking, often referred to as a 'black and white' thinking pattern (a tendency to make extreme judgements about events or catastrophic thinking). This pattern involves describing events or people in them (self and/or other) in binary terms (e.g. good person or bad person) and has been widely studied in relation with mental health. It has been identified as a maintaining factor for depression (Antoniou et al., 2017; Bonfá-Araujo et al., 2021; Teasdale et al., 2001).

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Dichotomous thinking of this kind has also been identified in studies using the repertory grid technique (RGT) (Fransella et al., 2004), and conceptualised as polarized thinking or polarised construing which is an important part of cognitive rigidity. Polarised thinking has been observed at higher levels across the broad spectrum of depression, including major depressive disorder, dysthymia and adjustment disorder (Aguilera et al., 2019; Feixas et al., 2021) and is also associated with other forms of psychological disorder such as personality disorders (especially borderline and narcissistic) and schizophrenia (e.g. García-Mieres et al., 2020). This theoretical and methodological approach draws inspiration from Personal Construct Theory (PCT) (Kelly, 1955), a constructivist theory with an eminently idiographic approach in which the aspects related to self-identity and interpersonal perception are fundamental. Kelly (1955) describes human beings as scientists who develop and adjust their knowledge and hypotheses based on experience, shaping their own worldview. This process allows them to anticipate the consequences of their actions and other events. To do this, they create personal constructs, which are descriptive categories or schemas that encompass experiences of feelings, sensations, thoughts, and actions, they use to perceive and understand the world. In this article, we adopt a view of cognition based on Kelly's conceptualization of the knowing ('cognoscere' in latin) process, which goes beyond viewing it merely as a thinking function. We have used the terms polarised or dichotomous ('black and white') thinking when referring to studies that use them but show here how this can reduce the conception of cognition to one function. PCT suggests that patients with depression arrange their perception of themselves, others, and the world in relatively polarised, monolithic terms that are resistant to change and revision (Neimeyer, 1985). However, the effect of cumulative trauma in combination with cognitive biases, such as polarised thinking, on the severity of depression has not been explored yet.

The present study extends the existing literature by examining the cumulative effect of trauma and stress, in combination with polarised thinking on the severity of depression. To achieve this goal, we tested three hypotheses. First, we hypothesised that individuals with depression are highly likely to have experienced at least one traumatic event in their lifetime, which is more negatively experienced than positively experienced. Second, we hypothesised that negative appraisal of traumatic events is strongly associated with depressive symptoms compared to the positive appraisal of these traumatic events. Third, we hypothesised that polarised thinking mediates the effect of traumatic experiences on depression.

MATERIALS AND METHODS

This study employs a cross-sectional design, utilising baseline data collected from a previous study (Feixas et al., 2016, 2018).

Participants

This study included a total of 172 patients (133 women). Of these, 128 participated in the entire previous project, while 44 were retrieved from the evaluation phase, as they met the inclusion criteria for the present study but did not receive treatment. Inclusion criteria were the presence of either Major Depressive Disorder or Dysthymia diagnosis (or both), assessed by *the Structured Clinical Interview for DSM-IV axis I Disorders* (SCID-I-CV) (First et al., 1996); and scoring higher than 19 on the *Beck's Depression Inventory-II* (BDI-II) (Beck et al., 1996) and completion of the questionnaire assessing cumulative trauma experiences. These patients were recruited from several primary and mental health centres in the area of Barcelona, Spain (for further details see Feixas et al., 2016). All participants provided their informed consent in a written format before taking part in the study. The Bioethics Committee at Universitat de Barcelona granted approval for the study protocol (ref. IRB00003099) and an amendment to the Bioethics Committee of the Universitat de Barcelona approved the use of the CTS-S data in this secondary data investigation.

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Instruments and measures

Depression

Diagnosis of depression was determined using the Spanish version of SCID-I-CV (First et al., 1996), which also collected information about other mental disorders, sociodemographic data, medication and psychotropic drug consumption. Depressive symptoms were assessed using the Spanish version of BDI-II (Beck et al., 1996; Sanz & Vázquez, 2011), a 21-item self-report instrument designed to assess the presence and severity of depression symptoms. The reliability of this measure was good ($\alpha = .82$) for the current sample.

Polarised thinking

Polarised thinking was assessed using the RGT. This is a semi-structured interview aimed at evaluating the set of personal constructs that the individual relies on to describe themselves and important people in their life. It starts with identifying elements, which include self now, ideal self ('how I would like to be'), and significant others recognised by the participant. These elements (typically, mother, father, siblings, partner, friends, mates and 'non-grata person', ranging from 10 to 20 depending on the case) are then compared in pairs to uncover personal constructs by exploring their similarities and differences (e.g. both sister and brother might be described as 'sociable', a label uttered by the participant, not provided by the researcher). In this sample, the mean of elements was 13.21 and the standard deviation was 2.58. For each identified similarity or difference, the participant is prompted to define the opposite characteristic (e.g. 'sociable vs. shy'). Once the participant has elicited a minimum of 10 constructs and is no longer able to generate new constructs (the maximum number in our study was 39), they are asked to rate each element according to the identified personal constructs. In this sample the mean of constructs 18.73 was and the standard deviation was 5.61. Ratings are assigned using a 7-point Likert-type scale, where one represents 'very much' for the left pole of the construct (e.g. 'sociable') and seven 'very much' for the opposite right pole (e.g. 'shy') (see Feixas & Saúl, 2004, for a more detailed description). The outcome of this process is a data matrix for each participant, from which several measures of the construction of self and cognitive structure can be calculated using the GRIDCOR software (Garcia-Gutierrez & Feixas, 2018). Polarisation was the grid measure used in this study, and it is determined by the percentage of extreme ratings (1 or 7) in the grid data matrix. High scores in this measure reflect the tendency for individuals to construe themselves and others in terms of all-or-nothing. According to Spanish data from a community sample (Trujillo, 2016), the mean proportion of polarisation for the general population is 28.11 ($SD = 15.79$) with a test–retest reliability score of .81.

Cumulative trauma

Traumatic experiences were assessed using the Spanish version of the Cumulative Trauma Scale-Short form (CTS-S) (Kira et al., 2008; Robles et al., 2009). By using the CTS-S, which has 33 items, it is possible to measure cumulative stressors and traumas based on occurrence, frequency, type and both negative and positive appraisals. The purpose of the scale is to give a complete evaluation of cumulative stressors and exposure to traumatising situations (Kira et al., 2020; Kira, Barger, et al., 2019).

Considering the alignment of the Spanish CTS-S version with recent studies of Kira et al. (2020), it is possible to identify not only the total cumulative traumatic experience (items 1–33) but also other specific experiences, such as cumulative non-traumatic stressors (serious life changes associated with re-marrying, the major life changes in forced relocations and the experience of a nervous breakdown; items 20, 23, 30), as well as seven major trauma types: collective identity trauma (trauma related to exposure to war and torture and discrimination based on race, ethnicity or national origin;

items 14, 17, 19, 23, 26, 31, 32); personal identity trauma (trauma related to sexual abuse, rape, incest and being robbed; items 10, 12, 13, 24, 25, 27); survival trauma (car accidents, life-threatening illnesses and natural disasters; items 1, 2, 3, 6, 7, 9); attachment trauma (abandonment by parents; items 15, 16); secondary trauma (trauma related to having witnessed a traumatic event occurring to another individual or group and affecting social interdependence; items 4, 5, 8, 11, 18, 21, 28); achievement trauma (traumatic stressors related to the achievement of life goals like success in school or business; items 22, 29) and gender discrimination (gender discrimination by family and society and institutions; items 26, 29, 30).

For each item, participants were asked to rate the occurrence and frequency of the traumatic event on a 5-point Likert-type scale (with 0 representing never and 4 representing many times); and assess the effect of the traumatic event on a 7-point Likert-type scale (1 = extremely positive; 7 = extremely negative) if the participant experienced it. Therefore, CTS-S encompasses two fundamental subscales for cumulative trauma dose: occurrence and frequency of experience, and appraisal subscales (negative and positive appraisal of events) (Kira, Barger, et al., 2019). The original scoring combines positive and negative appraised events into a unified final score. However, the first objective of this study was to compare the impact of positive and negative appraisal, leading to the splitting of the Likert scale responses to calculate two different outcomes: total trauma negative appraisal and total trauma positive appraisal. The original 1–7 Likert scale responses were transformed into two 0–3 Likert scales. Positive scores on the Likert scale were transformed as follows: original score of 1 = new score of 3 (extremely positive); original score of 2 = new score of 2 (very positive); original score of 3 = new score of 1 (slightly positive); original score of 4 = new score of 0 (neutral). All the events with positive scores were then added to obtain the total trauma positive appraisal outcome. Negative scores on the Likert scale were transformed as follows: original score of 7 = new score of 3 (extremely negative); original score of 6 = new score of 2 (very negative); original score of 5 = new score of 1 (slightly negative); original score of 4 = new score of 0 (neutral). The events with negative scores were summed to create a total trauma negative appraisal outcome. These four subscales (occurrence, frequency of experience, negative and positive appraisal of events) can also be generated for each of the trauma types (Kira, 2021b; Kira et al., 2020). Appropriate internal consistency has been demonstrated by the CTS-S ($a = 0.85$ in Kira et al., 2008; $a = 0.84$ in the present study).

Statistical analysis

All the analyses were conducted using IBM SPSS software (v. 27.0). Descriptive analyses were performed, including the calculation of means, standard deviations, and Cronbach's Alpha. Pearson correlations among all relevant variables were also computed for the analysis. To verify the first hypothesis, we performed a descriptive analysis of occurrence, frequency of experience, negative and positive appraisal of traumatic events. To verify the second hypothesis, we tested which independent variables were strongly associated with depression outcomes performing hierarchical regression analyses. We introduced sex and age in the first step. In the second step, we included polarised thinking. In the third step, we included the total trauma negative appraisal and positive appraisal variables. Finally, in order to test the third hypothesis, we performed three regression analyses following Baron and Kenny's (1986) indications to test the mediational model: first, regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and the mediator.

RESULTS

See Table 1 for the description of the baseline demographic and clinical characteristics of the participants of this study.

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TABLE 1 Baseline demographic and clinical characteristics of the participants.

Age (*n* = 172)	49.12 (±10.88)
Sex (*n* = 172)	
Women	133 (77.3%)
Men	39 (22.7%)
Marital status (*n* = 172)	
Single	26 (15.1%)
Married/living with a partner	87 (50.6%)
Separated/divorced	50 (29.1%)
Widowed	9 (5.2%)
Education level (*n* = 172)	
Elementary (6–12 years)	35 (20.3%)
Secondary school (12–16 years)	16 (9.3%)
High school/Professional training	84 (48.9%)
Higher	37 (21.5%)
Employment (*n* = 172)	
Full-time employment	37 (21.5%)
Part-time employment	5 (2.9%)
Housewife	11 (6.4%)
On sick leave	35 (20.3%)
Unemployed	43 (25%)
With a registered disability	14 (8.1%)
Retired	10 (5.8%)
Others	17 (9.9%)
Medication (*n* = 170)	
Antidepressant medication	122 (71.8%)
Clinical characteristics	
Chronicity (age of onset of first episode) (*n* = 171)	38.42 (±12.92)
Number of depression episodes (*n* = 172)	1.92 (±1.27)
BDI-II total score (*n* = 172)	36.57 (±9.41)
Affective disorders diagnoses (*n* = 172)	
Major depression disorder single episode	66 (38.4%)
Major depression disorder recurrent	77 (44.8%)
Dysthymia	12 (6.9%)
Major depression disorder and dysthymia	17 (9.9%)
Cognitive Index	
Polarised thinking (polarisation) (*n* = 171)	34.47 (±16.27)

Abbreviation: BDI-II, Beck's Depression Inventory-II.

Hypothesis 1. *Individuals with depression have experienced traumatic events, which have been valued more negatively than positively.*

Confirming our first hypothesis, the descriptive analysis in Table 2 shows that all the patients with depression experienced at least one episode of trauma in their lifetime. The most common and frequent traumatic experience was secondary trauma (89%), followed by survival trauma (87.2%), and the least common was attachment trauma (20.9%) followed by gender discrimination (39.5%). For all trauma

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types, the appraisals were consistently more negative than positive, with cumulative non-traumatic stressors and achievement trauma being identified as the most negatively appraised.

Hypothesis 2. *Negative appraisal of traumatic events is more strongly associated with depressive symptoms than is positive appraisal of traumatic events.*

Pearson correlations in Table 3 show a positive association between total trauma negative appraisal ($r = .258$, $p < .001$) and depressive symptoms.

In Table 4, we displayed hierarchical regression coefficients to demonstrate the statistical association of trauma variables (positive and negative appraisals) with the severity of depressive symptoms while accounting for the effects of age, sex and the cognitive measure of polarisation. Preliminary analyses were conducted to verify that the assumptions of normality, linearity, multicollinearity and homoscedasticity were not violated.

The final model, which included age, sex, polarisation and the two trauma-related variables, accounted for 12% of the variance in depression ($F(5, 165) = 4.502$, $p = .001$), meaning that the full set of predictors explained 12% of the variability in depression scores. Importantly, the two trauma variables

TABLE 2 Occurrence, frequency and appraisal of trauma variables derived from CTS-S.

	Occurrence	Frequency	Negative appraisal[a]	Positive appraisal[a]
Variables	≥1 episode	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Total trauma	100%	8.87 (3.94)	0.46 (2.89)	0.03 (0.05)
Cumulative non-traumatic stressors	84.3%	1.12 (.67)	0.67 (0.48)	0.05 (0.19)
Collective identity trauma	71.5%	1.41 (1.32)	0.30 (0.39)	0.02 (0.06)
Personal identity trauma	70.9%	1.44 (1.38)	0.49 (0.56)	0.01 (0.06)
Survival trauma	87.2%	1.77 (1.15)	0.43 (0.43)	0.02 (0.08)
Attachment trauma	20.9%	0.31 (0.64)	0.22 (0.55)	0.03 (0.20)
Secondary trauma	89%	1.98 (1.26)	0.53 (0.43)	0.01 (0.04)
Achievement trauma	70.9%	0.92 (.70)	0.68 (0.75)	0.04 (0.19)
Gender discrimination	39.5%	0.59 (0.87)	0.41 (0.72)	0.08 (0.24)

Abbreviations: CTS-S, Cumulative Trauma Scale Short Form; *M*, mean; SD, standard deviation.

[a]The original 1–7 Likert scale was transformed into two 0–3 Likert scales. Positive scores on the Likert scale were transformed as follows: original score of 1 = new score of 3 (extremely positive); original score of 2 = new score of 2 (very positive); original score of 3 = new score of 1 (slightly positive); original score of 4 = new score of 0 (neutral). Events with positive scores were summed for the Total Trauma Positive Appraisal outcome. Negative scores on the Likert scale were transformed as follows: original score of 7 = new score of 3 (extremely negative); original score of 6 = new score of 2 (very negative); original score of 5 = new score of 1 (slightly negative); original score of 4 = new score of 0 (neutral). Events with negative scores were summed for the Total Trauma Negative Appraisal outcome.

TABLE 3 Correlations between age, depression symptoms, cognitive variable (polarisation) and trauma variables derived from CTS-S.

Variable	1	2	3	4
1. Age				
2. BDI-II	.034			
3. Polarisation	−.006	.230**		
4. Total trauma negative appraisal	−.081	.258**	.192*	
5. Total trauma positive appraisal	.004	.051	.075	.299**

Abbreviation: CTS-S, Cumulative Trauma Scale Short Form.

*$p < .05$, **$p < .01$.

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TABLE 4 Regression coefficients for tested models including a cognitive variable (polarisation) and total trauma variables (positive and negative appraisal) from the CTS-S to examine their association with depressive symptoms.

		St. β	t	p	95% CI	ΔR² (p)
1st step	Age	.035	0.46	.643	−0.099, 0.161	.025 (.120)
	Sex	.152	1.99	.048	0.030, 6.746	
2nd step	Age	.037	.492	.624	−0.095, 0.158	.079 (.002)
	Sex	.156	2.09	.038	0.196, 6.743	
	Polarisation	.232	3.13	.002	0.049, 0.219	
3th step	Age	.054	.734	.464	−0.079, 0.172	.120 (.023)
	Sex	.133	1.81	.072	−0.274, 6.224	
	Polarisation	.193	2.58	.011	0.026, 0.196	
	Total trauma negative appraisal	.214	2.73	.007	0.020, 0.123	
	Total trauma positive appraisal	−.023	−0.30	.763	−0.509, 0.374	

Abbreviations: CI, confidence interval; CTS-S, Cumulative Trauma Scale Short Form; St. β, standard coefficient; ΔR^2, squared R.

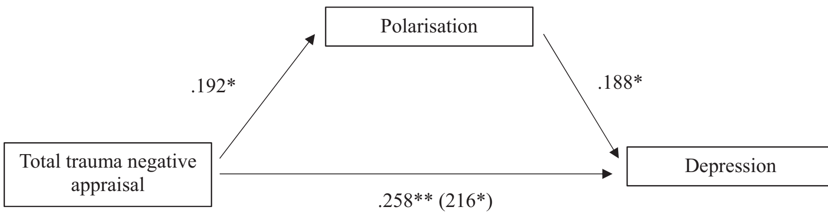

FIGURE 1 Mediation path model. Standardised regression coefficients for the relationship between total trauma negative appraisal and depression as mediated by polarisation. The standardised regression coefficient for the association between total trauma and depression, controlling for polarisation, is in parentheses. $*p<.05$, $**p<.001$.

contributed a unique 4% of explained variance beyond the effects of age, sex and polarisation (R squared change = .04, F change (2, 165) = 3.86, p = .023). This indicates a substantive contribution of trauma-related factors to depressive symptoms. In the final model, only total trauma negative appraisal and polarisation variables were statistically significant, with the total trauma negative appraisal recording a higher beta value ($\beta = .214, p = <.05$) compared to polarisation ($\beta = .193, p = <.05$). These results confirm the second hypothesis.

Hypothesis 3. *Polarised thinking mediated the effect of traumatic experiences and depression.*

First of all, a t-test for independent samples was conducted to compare the polarisation scores between the community sample group (M = 28.11, SD = 15.76, N = 117) reported in Trujillo (2016), and the group of patients with depression (M = 34.47, SD = 16.27, N = 171). The results indicated a statistically significant difference between the two groups, $t(286) = 3.30$, $p = .0011$. These findings suggest that individuals in the depression group exhibited significantly higher scores compared to the normative group.

Secondly, as shown in Table 3, the presence of positive correlations of both polarisation ($r = .230$, $p < .001$) and total trauma negative appraisal ($r = .258$, $p < .001$) with depressive symptoms allows us to explore Hypothesis 3.

Finally, the mediation results are illustrated in Figure 1. We observed a partial mediation effect of polarised thinking in the relationship between traumatic experiences and depression. According to the present results, experiencing a cumulative series of traumatic events with negative appraisals leads to an increase in polarisation, which in turn contributes to elevated depressive symptoms.

DISCUSSION

Our results reinforce the significance of trauma in gaining a deeper understanding of emotional pain expressed through severe depressive symptoms, as was found in preliminary results (Salla et al., 2022). As we hypothesised, it is noteworthy that all participants had experienced at least one traumatic event in their lifetime, with secondary and survival trauma, the two most reported (accounting for over 80%). These results are not surprising considering the accumulating evidence linking trauma exposure to depressive disorder (e.g. Mandelli et al., 2015) and the fact that approximately 70% of the world's population has been exposed to a traumatic life event (Benjet et al., 2016; Kessler et al., 2017). Furthermore, it appears that personal involvement in a traumatic experience is not necessary to suffer its effects. In fact, both secondary and survival trauma types have been associated with various mental health conditions, including depression (Kira et al., 2013).

Based on the participants' responses, cumulative non-traumatic stressors and achievement trauma emerge as the types of trauma associated with a more negative appraisal. These results provide evidence that stressful life events, such as experiencing a nervous breakdown or losing employment, can be the most distressing and have significant implications for psychological well-being and the development of depressive symptoms, as reported in other studies (Herbison et al., 2017; Stroud et al., 2008).

Confirming our second hypothesis, our data revealed that traumatic experiences with negative appraisal are more strongly associated with depressive symptoms than those with positive appraisal. Consistent with findings from studies on adolescent samples (Espejo et al., 2012; Moya-Higueras et al., 2020), assessing appraisals—or the subjective impact of stressful life events—proves particularly relevant for preventing internalizing symptoms such as depression. Based on our results, incorporating the evaluation of the subjective impact of traumatic events into depression prevention protocols could be highly beneficial.

Finally, as predicted in the third hypothesis, polarised thinking was found to partially mediate the relationship between traumatic experiences and depression. Experiencing accumulated traumatic events with negative appraisal appears to increase polarised thinking, which, in turn, contributes to elevated depressive symptoms. The association between polarised thinking and depression has been already documented (e.g. Feixas et al., 2021). In our sample, people with depressive symptoms show significantly higher polarisation than the general population (Trujillo, 2016). However, the relationship between trauma and cognitive aspects requires further examination. Recent studies have found that, on one hand, cognitive rigidity, of which polarised thinking is a component, could contribute to the maintenance of Post-Traumatic Stress Disorder (PTSD) symptoms (e.g. Meyer et al., 2019), and on the other hand, reducing cognitive rigidity improves the outcomes of PTSD treatment (Alpert et al., 2023). Considering these findings along with our results, we suggest that polarised thinking, in our study representing 'the polarised ratings of how patients construe self and others', may increase after a negative traumatic event as a potential strategy to prevent or protect oneself from experiencing further negative events. For example, anticipating with dichotomous thinking who is 'good vs. bad' or 'generous vs. egoist', could avoid encountering potential negative events. However, polarised thinking may also hinder the assimilation of new experiences in a complex way, making it difficult to flexibly adjust interpretations and adapt to new situations, and further worsen or perpetuate depressive symptoms. Consequently, these aspects may hinder learning and change. These results emphasise the importance of addressing traumatic events but also polarised thinking in order to reduce depressive symptoms. Therefore, it is crucial to include the assessment of both conditions in the design of treatment protocols for depression and incorporate interventions aimed at fostering greater flexibility in one's cognitive organisation of self, others and the world, as some therapies have successfully done (Feixas et al., 2016, 2018). Moreover, the reduction of fear derived from traumatic situations may be a necessary step for the revaluation and reorganisation of constructs, allowing greater openness to new experiences and a more flexible processing of information. To achieve this, interventions that emphasise experiential learning, language development and non-verbal expression in the construction of more complex meanings may also be beneficial.

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The current study, while offering valuable insights into the combined effects of cumulative trauma, stress, and polarised thinking on the severity of depression, has several limitations. One notable limitation is the inability to test the sex differences due to the underrepresentation of men in our sample. Furthermore, only one sex variable, referring specifically to biological and physiological characteristics, was available for this sample. Another limitation is that we only examined the effect of trauma and polarisation on depression in one direction. While this allowed us to study the associative relationship between these variables, the cross-sectional nature of the study prevents assessing temporal ordering, and it also means that causality cannot be inferred. Finally, while the RGT aims to capture the uniqueness of each participant's personal meanings, we recognise that individual scores of polarisation are based on a slightly different number of elements and constructs, which may limit the generalizability of the results.

This study highlights several important avenues for future investigation. First, comparative studies employing general population samples are needed to establish whether the observed trauma exposure patterns represent a distinctive characteristic of clinical depression or reflect broader epidemiological trends. Second, longitudinal research should examine the temporal dynamics of cognitive polarisation during therapy, particularly investigating whether reductions in dichotomous thinking correlate with improvements in self-compassion, interoceptive awareness, and physiological markers of stress regulation (e.g. heart rate variability). Such multimodal investigations could reveal crucial mechanisms of therapeutic change while bridging Kelly's constructivist theory with contemporary trauma neuroscience. Third, rigorous gender-specific analyses are warranted to elucidate potential variations in trauma response and cognitive processing pathways. Finally, psychotherapy research should prioritise developing and evaluating targeted interventions that simultaneously address trauma processing and cognitive flexibility, potentially integrating constructivist and somatic approaches for enhanced treatment efficacy.

CONCLUSIONS

Our results reveal that the majority of our sample had suffered at least one traumatic event, with secondary and survival trauma being the most reported, and the negative appraisal of these events was related to an increase in depressive symptoms. Moreover, our study pointed out that cumulative trauma has a key impact on the understanding of the later development of depressive symptoms, but interestingly, this relationship is partially mediated by the level of polarised thinking. Thus, it may be relevant to include cognitive interventions in specialized trauma treatments with depressive symptomatology.

AUTHOR CONTRIBUTIONS

Marta Salla: Conceptualization; data curation; formal analysis; writing – original draft; writing – review and editing. **Mari Aguilera:** Conceptualization; data curation; formal analysis; writing – original draft; writing – review and editing. **Clara Paz:** Data curation; formal analysis; writing – review and editing. **Jorge Moya:** Formal analysis; writing – review and editing. **Guillem Feixas:** Funding acquisition; project administration; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

None of the authors have a conflict of interest to disclose.

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DATA AVAILABILITY STATEMENT

In order to protect patient privacy, data are available from the corresponding author (Marta Salla: marta.salla@uab.cat) for researchers who meet the criteria for access to confidential data.

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