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Protective and vulnerability factors of posttraumatic growth during the COVID-19 pandemic

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Abstract

Background and objectives: The COVID-19 pandemic is a major life event that has brought new challenges and threats. Some people may experience positive changes, such as post-traumatic growth (PTG). Several factors may enhance or hinder this possibility of development. There is extensive literature considering protective and vulnerability factors separately. However, there is a lack of studies considering both factors based on a holistic approach. This study aims to determine the weight of two protective factors (resilience and life purpose) and two vulnerability ones (anxiety and depression) in PTG, considering the COVID-19 affectation. **Design and Methods:** 749 Spanish people aged 18–84 years old completed a survey that included sociodemographic data, direct/indirect affectation by COVID-19, anxiety, depression, resilience, life purpose and PTG. Path analysis was used to test the predictors of PTG. **Results:** Women showed higher levels of PTG. The effect of COVID-19 symptoms on PTG is mainly mediated by life purpose, and anxiety to a lesser extent. Two indirect effects were found: (1) the negative effect of depression on PTG through resilience and life purpose assessed simultaneously; (2) the positive effect of resilience on PTG through life purpose. **Conclusions:**The originality of the approach of this research lies in the integration of vulnerability and protection factors to determine PTG. Identifying protective and vulnerability factors is crucial to prevent the development of mental disorders in risk populations. The development of interventions considering depressive disorders as PTG inhibitors while highlighting life purpose to strengthen mental health is needed.

Keywords COVID-19 · Resilience · Purpose in life · Anxiety · Posttraumatic growth · Depression

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Introduction

The COVID-19 pandemic has implied biological, psychosocial and spiritual survival challenges. This life-threatening risk, experienced directly or vicariously, has shown a high prevalence of posttraumatic stress symptoms (American Psychiatric Association, 2013). This risk has been aggravated by the high mortality rate, social distancing and isolation (Bridgland et al., 2021) and the unfinished mourning due to legal restrictions. All those elements have offered chances for psychological growth and emotional readjustment (Borghi & Menichetti, 2021).

Despite the negative consequences derived from the COVID-19 pandemic, many people can perceive positive changes when facing the multiple stressors associated with COVID-19 (Lunasky et al., 2021). This construct is described as posttraumatic growth (PTG) and is defined as the positive change that a person experiences due to the transformation process from experiencing a traumatic event

(Calhoum & Tedeschi, 1999). When experimenting PTG the person not only resists and survives, but also the traumatic experience produces a favourable change or self-realization (Tedeschi & Calhoun, 2004).

The controversy concerning the illusory perceptions of PTG should be noted, due to its implications for the conceptualization and measurement of this construct, especially regarding the use of cross-sectional designs and retrospective evaluations (Jayawickreme & Infurna, 2021). In this line, Gover et al. (2022), in a systematic review and meta-analysis of cognitive biases in PTG perceptions, concluded that downward comparison bias, positive attention bias, and growth beliefs showed stronger relationships with perceived PTG than defensiveness, memory bias and social desirability bias. This differentiation is relevant in the contextualization of the PTG experimented in the pandemic period by the justification that we will point out concerning the role of reminiscence.

The COVID-19 has been able to mark the beginning of the PTG process by producing, for both individual and collective levels, a breakdown of the basic schemes about life, the world, freedom, or the welfare state. This discrepancy challenges people´s beliefs, goals prioritization or the ability to manage the resulting emotional discomfort (Chen & Tang, 2021). When facing this crisis, recurring thoughts and ruminations are triggered to reduce or eliminate the suffering. Initially, it is an automatic type of processing that progressively focuses on reconstructing the initial schemes to adapt them to the demands and the current situation. It is precisely this shift in focus, from survival to new opportunities, that gives a new signification to trauma and enables PTG (Henson et al., 2020). This is supported by recent studies (Akdag et al., 2023) in which pro-social reminiscence and self-positive reminiscence predicted PTG, while self-negative reminiscence predicted PTSD. These results help to validate the role of retrospective reports since reminiscence, as a natural and universal process, displays cognitions and emotions related to the traumatic situation experienced.

This “constructive rumination” associated with the search for meaning is a restorative process that occurs in a context of uncertainty and perceived vulnerability. Uncertainty due to the initial ignorance of contagion mechanisms or treatment strategies. And vulnerability due to the successive strains of the virus with guidelines and indications from health officials that have not been always consistent (Cooke et al., 2020). In a systematic review that estimated death anxiety during the COVID period, Patra et al. (2023) showed a standard score of 50%. This score was higher in patients with COVID-19 (59.4%), chronic patients (58.9%), and older adults (56.4%). The lowest scores were found in the general population (42.9%). However, general population scores still showed significant levels of emotional distress. For this reason, strengthening variables related to PTG would justify the adaptive response to stressful situations in general (Mkhitaryan et al., 2019) or to the current context of COVID-19 (Lunansky et al., 2021).

Despite COVID-19 harmful implications, the growth response is possible by attributing meaning to this pandemic and by making changes in both inter and intra-personal perception (Bernabé-Valero et al., 2021). PTG must be understood as a combination of cognitive processing and active coping style, with the additive role of other internal factors such as personality traits, or external factors such as social support networks. Resilient behaviour has been supported as a key protective factor. Resilience is defined as the ability to resist adverse outcomes after exposure to trauma. Although there is not a consensus on this concept, there is agreement on its multiple levels (from the biological to the social one), and its dynamic and multidimensional nature (Denckla et al., 2020). It has been also confirmed the health-protective role of engagement and resilience, despite there being other variables that mediate it. For example, the lack of personal protective equipment, believing that it is easy to get infected by COVID-19 or working directly in contact with the population, are variables associated with lower levels of resilience and worse perception of health (Talavera-Velasco et al., 2021). Kalaitzaki and Rovithis (2021) provided evidence of the role of resilience and coping strategies in modulating secondary traumatic stress and vicarious post-traumatic growth in healthcare workers during the first COVID-19 lockdown in Greece. The results indicate that both variables predicted positive and negative effects (growth/stress). These results point out the need to consider these two variables in both healthcare professionals and general population to increase psychological well-being in crises.

In contrast, vulnerability factors when facing stressful life events can generate anxious or depressive psychopathology. There is also a very relevant aspect that connects depression and posttraumatic stress disorder. According to Payne et al. (2019), 76% of adults with depression have intrusive memories, which has important implications for maintaining the mental disorder (Ramos-Vera & Serpa, 2021). Due to the automatic nature of intrusive memories, only those whose rumination is deliberate enable posttraumatic growth (Andrades & García, 2021). Recent applications in grief rely on this strategy of making the process conscious (Williams et al., 2021). These are aspects aligned with the theoretical and derived formulations of the most representative authors of PTG (Tedeschi & Calhoun, 2007; Tedeschi & Moore, 2021). Regarding the controversies and the ontological entity of the PTG, Jayawickreme et al. (2021) stress the reconceptualization of PTG in terms of personality change can solve some weaknesses. Thus, the assessment of change

through variables such as purpose or meaning materialized in vital projects, would be an operationalization, which in our approach is specified in the variable life purpose. And more or less directly, the key points pointed out by these authors such as character strengths, wisdom or narrative identity.

Regarding the vulnerability variables (anxiety and depression), several studies analyzed the consequences derived from COVID-19 in Spain. In the general population, Justo-Alonso et al. (2020) addressed the mental state and the psychological impact of five different generations to the pandemic in its early stages. The youngest participants were the most affected (more hyperactivated, avoidant, anxious, depressed and stressed). In contrast, the older ones presented better responses in general: less intrusion, claustrophobia, somatization, and fewer difficulties in maintaining routines. When analyzing the repercussions of these risk variables in childhood and adolescence, Orgilés et al. (2021) conducted a cross-cultural study (Spain, Italy and Portugal) finding higher anxiety levels in Spanish children and depressive symptoms in Spaniards and Italians. Finally, there was an association of anxiety and depression responses in children whose parents reported higher stress levels. In the older population, the prevalence is linked to housing issues, such as living in large urban centres (Castellanos et al., 2020), or derived from the situation of widowhood (Pan & Liu, 2021), the mediating role of coping styles that enable PTG (Peters et al., 2021) or the lack of mourning (Qasim & Carson, 2020). The influence of COVID-19 on the appearance of adjustment disorders includes depressive and anxiety disorders as response keys. Regarding the latter, Sankova et al. (2021), in a study with first-year medical students, found reactive anxiety average scores of 43.28 (+- 12.85). The moderately severe levels of anxiety can be explained by the long period of online training (exceeding 25% of the course). Therefore, high levels of reactive anxiety affected the quality of education and the adaptive capacities of the students.

This study is based on the stress model of Lazarus and Folkman (1984) which postulates that the perception of a stressful situation, such as the COVID-19 pandemic, depends on the person´s perception of their capacity in using available coping strategies. On the one hand, the literature supports that the presence of vulnerability indicators, such as anxiety and depression behaviours, would inhibit such possibility (Henson et al., 2020; Howells et al., 2020; Kou et al., 2021). On the other hand, coping mediated by resilience and life purpose would facilitate performance and generate possibilities for new developments. We expand the verified model with positive factors with pre-pandemic stressors developed by Quezada-Berumen and González-Ramírez (2020). We broaden this perspective with a sample that has experienced COVID-19. In addition, we aim to verify the robustness of the model based on the degree of experimentation of pandemic stress (direct/indirect impact by COVID-19).

The originality of the approach of this research lies in the integration of vulnerability and protection factors to determine the specific weight of each of them and the interaction between those with positive and negative valence to explain the PTG. There is extensive literature on each of them separately, but the research gap provided by this study is precisely the holistic approach to both types of factors. It is a comprehensive approach, following the model of Lazarus and Folkman (1984), operationalized in both types of factors to respond to the stress generated by the COVID-19 pandemic and the explanation of PTG.

The designed model (Fig. 1) hypothesizes the following: H1. Experimenting pandemic stress (both direct and indirect) will be negatively associated with PTG; H2. Experimenting pandemic stress (both direct and indirect) will be positively mediated by resilience and life purpose; H3.

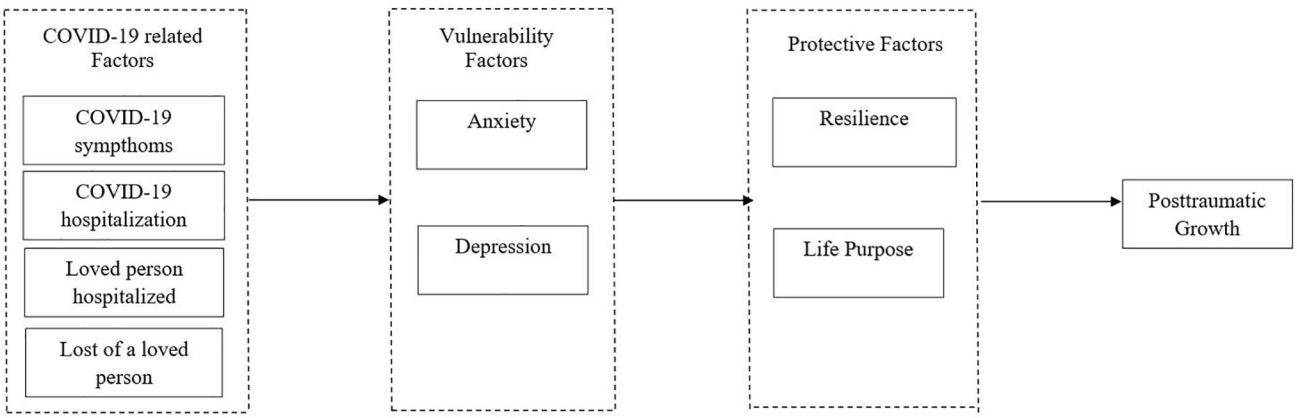

Fig. 1 Model hypothesized based on Lazarus and Folkman Model (1980)

Table 1 *Sociodemographics*

	M	DT
Gender		
Women	69.6 (520)	520
Men	53.93	18.99
Civil Status		
Married	49.5	370
Divorced	21.6	94
Single	31.1	232
Widowed	6.8	51
Age	51.40	19.82

M = mean; SD = Stardard Deviation

Table 2 *COVID-19 variables*

	M	DT
Suffering COVID-19 sympthoms		
Yes	14.5	108
No	85.5	639
Being hospitalized		
Yes	1.5	11
No	98.5	736
Having had loved person hospitalized		
Yes	79.7	595
No	20.3	152
Having lost a loved person		
Yes	13.5	100
No	86.5	647

M = mean; SD = Stardard Deviation

Experimenting pandemic stress (both direct and indirect) will be negatively mediated by anxiety and depression.

Methods

Participants and procedure

749 people over 18 years old from different regions of Spain participated in this study. We deleted two participants from the analysis because they did not answer more than 25% of the items. The average age was 51.40 (*SD* = 19.82), ranging from 18 to 84 years old. There was a higher percentage of women (69.6%) and married participants (49.5%) (Table 1).

When considering COVID-19 related variables, 14.5% of the participants had suffered COVID-19 symptoms and only 11 people were hospitalized. Moreover, 79.7% had had a loved person hospitalized because of COVID-19 and 13.5% of them lost a relative of COVID-19 (Table 2).

Once the study was approved by the CEU San Pablo University Research Ethics Committee (reference 436 – 20/26), we administered a web-based survey during the second wave and following the COVID-19 pandemic in Spain (between August 2021 and January 2022). In this moment, the lockdown had already finished, and the restrictions were focused on wearing masks indoors and keeping social distance. We collected the sample via snowball sampling. Participants were asked to sign the informed consent before responding to the survey. There were also given several instructions explaining the objectives of the study, guaranteeing the anonymity of the results and inviting them to be honest. It took participants approximately 30 min to respond.

Measures

Resilience

We used the Brief Resilient Coping Scale (Sinclair & Wallston, 2004; Spanish version validated in older adults by Moret-Tatay et al., 2015). It includes the four items from the original scale that describe the essence of resilience. That is being able to adapt to use adaptive coping styles to solve stressful events in a flexible and commitment way. Participants rated on a 5-point Likert scale from 1 (nothing) to 5 (a lot). This scale showed good internal consistency in this study, achieving a Cronbach alpha of 0.76.

Life purpose

It was assessed with the subscale life purpose of the Spanish version of the Ryff´s Psychological Well-Being Scale (Ryff, 1989) validated by Díaz et al. (2006). This subscale includes six items that evaluate the extent to which participants felt their lives had meaning, purpose, and direction. It includes both direct and reversed items, which are scored in a 6-point Likert scale, ranging from 1 (totally disagree) to 6 (totally agree). This subscale showed a high internal consistency in this study, with a Cronbach's alpha of 0.83.

Anxiety and depression

We used the Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983). This scale consists of 14 items in which participants were asked to respond 4-point Likert scale (from 0 to 3) regarding several symptoms experimented on the past week. Seven items assess anxiety and the other seven depression. It showed good internal consistency in this study with a Cronbach's alpha of 0.83 for anxiety and 0.79 for depression.

Posttraumatic growth

We used the Spanish version developed by Pérez-Sales (2006) of the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996). It consists of 21 items that assess the perception of positive changes after a stressful event. The scoring ranges from 0 to 5, in which 1 means "no change" and

5 refers to ''very great change.'' For this study, we used the total score, which showed good internal consistency for the total score in this study (Cronbach´s alpha = 0.93).

COVID-19 related variables

We assessed both the direct and indirect effects of COVID-19. For direct affection, we asked if the participants had COVID-19 symptoms (0 = no; 1 = yes) and if they had been hospitalized (0 = no; 1 = yes). For indirect affection, we asked if they have had a loved person hospitalized (0 = no; 1 = yes). or had lost a relative (0 = no; 1 = yes).

Analytic strategy

First, we conducted descriptive analysis and correlations between the outcome variables (anxiety, depression, life purpose, resilience and PTG). We also developed student t-tests and one-factor ANOVAs to analyze mean differences on the outcome variables by COVID-19 related variables and on PTG by sociodemographics. Path analysis was developed to evaluate the relationships between participants´ vulnerability variables (COVID-19 related variables, anxiety and depression) and PTG and we also tested whether these relationships were mediated by resilience and life purpose considered here as protective variables. We used the following fit indexes following Hu and Bentler (1999) and Kline (2005) suggestions: chi-square statistic (χ^2), and the ratio of chi-square to degree of freedom (χ^2/gl). The goodness-of-fit index (GFI), the comparative fit index (CFI), the Tucker-Lewis index (TLI), Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA) were used. An indication of a good model fit occurs when scores in GFI and CFI are over 0.90, TLI over 0.95, in RMSEA are below 0.06 and in SRMR are 0.08 or lower (Hu & Bentler, 1999). We used bootstrapping to analyze direct and indirect effects. Statistics 27 and AMOS 25 were used to perform data analysis.

Results

Descriptive analyses

Table 2 presents the means, standard deviations, and Pearson correlations of the variables. Depression shows a significant and positive correlation with anxiety and negative correlations with life purpose, resilience and PTG. Anxiety shows negative correlations with life purpose and resilience. Resilience correlated positively with life purpose and PTG. Finally, PTG and life purpose correlate significantly (Table 3).

We then analyzed differences in PTG by sociodemographic characteristics. There were significant differences by sex (t = -2.77; $p < .01$), showing women higher levels ($M = 58.08$; $SD = 18.72$) than men ($M = 53.93$; $SD = 18.99$). In contrast, age did not show any correlation with PTG. Neither PTG means showed differences by civil status.

We also tested if there were differences in the outcome variables based on direct or indirect COVID-19 affection. We only found a significant difference on anxiety by having experimented COVID-19 Symptoms (t = -2.324; $p < .05$), finding higher levels of anxiety those who experimented symptoms ($M = 6.78$; $SD = 3.83$) compared with those who did not ($M = 5.90$; $SD = 3.60$). In contrast, having been hospitalized, having a relative hospitalized or losing a loved one did not show any difference in the outcome variables.

Structural equation modeling

We hypothesized that the effects of COVID-19 affection (direct and indirect), anxiety and depression on PTG would be mediated by the protective variables life purpose and resilience (Fig. 1). This model showed a poor data fit (χ^2 = 734.889; $\chi^2/gl = 22$; $p = .001$; $GFI = 0.844$; $CFI = 0.423$; $TLI = 0.56$; $RMSEA = 0.208$; $SRMR = 0.147$).

To increase the degrees of freedom we deleted some insignificant paths. We used the modification fit indexes information to conduct modifications in the model. At each step, we eliminated the parameter that produced the best improvement to the fit. This procedure lasted until data reached a good data fit (Joreskog, 1993). This new model

Table 3 Pearson Correlations, means, standard deviations of the outcome variables

	Depression	*Anxiety*	*Resilience*	*Life Purpose*	*Posttraumatic Growth*
Depression					
Anxiety	.660***		-		
Resilience	−.445***	−.375***		-	
Life Purpose	−.544***	−.367***	.507***		
PTG	−.167***	−.041	.292***	.281***	
Mean	4.04	6.03	15.10	27.57	56.82
SD	3.24	3.65	3.09	4.85	18.89

PTG = Posttraumatic Growth; ***$p < 0{,}001$

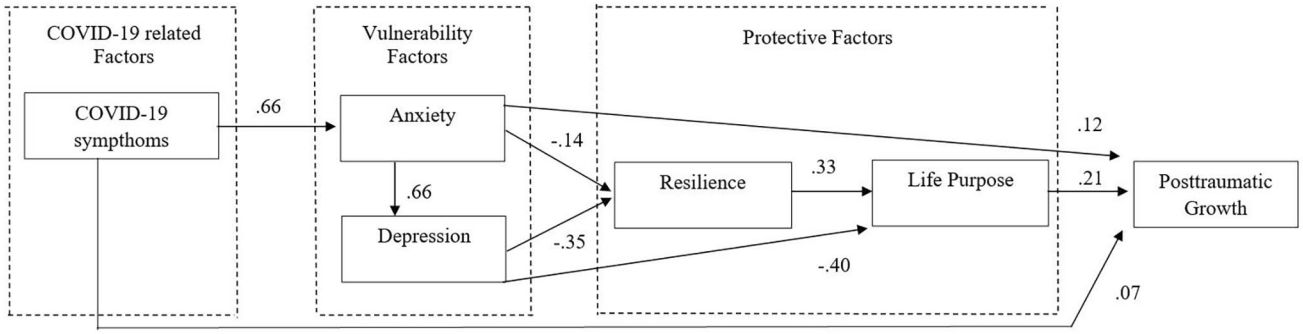

Fig. 2 Final structural equation model with standardized regression weights

Table 4 *Final Structural Equation Model Results*

			RW	*SRW*	*SE*	*CR*	*p*
COVID-19 Symptoms	◊	Anxiety	.879	.085	.378	2.327	.020
Anxiety	◊	Resilience	− .123	− .145	.037	-3.348	.001
Depression	◊	Resilience	− .333	− .349	.041	-8.056	.001
Resilience	◊	Life Purpose	.521	.330	.051	10.297	.001
Depression	◊	Life Purpose	− .598	− .397	.048	-12.382	.001
Life Purpose	◊	Posttraumatic Growth	.799	.207	.159	5.036	.001
Anxiety	◊	Posttraumatic Growth	.599	.116	.198	3.029	.002
Resilience	◊	Posttraumatic Growth	1.409	.231	.249	5.660	.001
COVID-19 Symptoms	◊	Posttraumatic Growth	3.587	.067	1.844	1.945	.050
Anxiety	◊	Depression	.586	.660	.024	23.968	.001

RW = regression weights; SRW = standarised regression weights; SE = standard error; CR = critical radio

showed an excellent model fit (χ^2=5.328; χ^2/gl = 5; p = .377; *GFI* = 0.998; *CFI* = 0.999; *TLI* = 0.990; *RMSEA* = 0.009; *SRMR* = 0.019) (see Fig. 2) (Tables 4 and 5).

According to the model hypothesized, we found that COVID-19 symptoms affect participants´ anxiety and PTG levels, finding higher levels of anxiety and PTG in those participants who had symptoms compared with those who did not. COVID-19 symptoms were also related indirectly to depression, resilience, life purpose and PTG.

Anxiety showed a direct positive effect on PTG and a negative one on resilience. Thus, anxiety was associated indirectly and negatively with PTG as well as with life purpose and resilience. The relationship between depression and PTG was mediated by resilience and life purpose. Specifically, people with more depressive symptoms showed fewer levels of life purpose and resilience and, in turn, lower levels of PTG.

In contrast to our expectations, life purpose and resilience were not at the same level. In the model that showed a good fit, resilience was positively associated with PTG both directly and indirectly through life purpose. Finally, life purpose only affected PTG directly.

Discussion

This study aimed to demonstrate the buffering role of resilience and life purpose when coping with the stress associated with the COVID-19 pandemic and the vulnerability produced by the anxiety and depression responses. PTG was considered the dependent variable, expecting a positive influence of life purpose and resilience and a negative of anxiety and depression on PTG.

Results showed psychopathological keys of the COVID-19 era, such as the positive association between anxiety and depression and the fact of being both risk factors (Castellanos et al., 2020; Chen & Tang, 2021; Orgilés et al., 2021; Pan & Liu, 2021; Vetter et al., 2021). In addition, the negative relationship of anxiety and depression with life purpose (Lozano-Díaz et al., 2020; Oltra & Boso, 2020) and resilience (Cao et al., 2020) is consistent with previous literature.

Our results are also in line with previous literature supporting positive correlations between the protective variables life purpose and resilience (Bernabé-Valero et al., 2021), as well as their positive association with PTG (Denckla et al., 2020; Henson et al., 2020). Tsouvelas et al. (2022) provide an additional clue about the protective role of resilience in situations of secondary traumatic stress. Although the study refers to the field of nurses, a part of the

Table 5 *Direct and Indirect Effects using Bootstraping*

			Direct Effect	*p*	Indirect Effect	*p*
COVID-19 Symptoms	◊	Depression	-	-	.056	.012
COVID-19 Symptoms	◊	Anxiety	.085	.011	-	.-
COVID-19 Symptoms	◊	Resilience	-	-	– .032	.013
COVID-19 Symptoms	◊	Life Purpose	-	-	-,033	.010
COVID-19 Symptoms	◊	Posttraumatic Growth	.067	.029	– .004	.081
Depression	◊	Anxiety	-	.-	-	-
Depression	◊	Resilience	– .349	.007	-	-
Depression	◊	Life Purpose	– .397	.003	– .115	.004
Depression	◊	Posttraumatic Growth	-	-	.-.186	.004
Anxiety	◊	Depression	.660	.002	-	-
Anxiety	◊	Resilience	– .145	.002	– .230	.005
Anxiety	◊	Life Purpose	-	-	– .386	.002
Anxiety	◊	Posttraumatic Growth	.116	.007	– .166	.003
Resilience	◊	Depression	-	-	-	-
Resilience	◊	Anxiety	-	-	-	-
Resilience	◊	Life Purpose	.330	.004	-	-
Resilience	◊	Posttraumatic Growth	.231	.003	.068	.003
Life Purpose	◊	Depression	-	-	-	-
Life Purpose	◊	Anxiety	-	-	-	-
Life Purpose	◊	Resilience	-	-	-	-
Life Purpose	◊	Posttraumatic Growth	.207	.004	-	-

population has repeatedly experienced the consequences of the pandemic, an aspect that could help to understand the contributions of our work. These authors point out that resilience exhibited a protective effect (partial mediation) on the strong relationship between dissociative coping strategies and PTG, results similar to those reported in this study.

Only depression showed a direct and negative association with PTG while anxiety showed a positive one contrary to previous literature (Howells et al., 2020; Kou et al., 2021). This result may e explained by the high prevalence of intrusive memories in this disorder (Payne et al., 2019), which would prevent the controlled ruminative mechanism of PTG (Andrades & García, 2021). Akdag et al. (2023) stated that pro-social reminiscence predicts PTG through its association with perceived social support and resilience.

Regarding sociodemographic variables, we found higher levels of PTG in women in line with previous research (Quezada-Berumen & González-Ramírez, 2020). In contrast, we did not find any difference by age (Wu et al., 2019) or marital status (Ramos-Vera & Serpa, 2021). The age is relevant because, according to Celdrán et al. (2021), only a quarter of older adults experienced PTG in the COVID-19 pandemic and PTG showed a co-variation with internal (age) and external (social resources) keys. However, our results, in terms of sex and age, are similar to those found in Italian population (Menculini et al., 2021).

The results regarding the type of affectation by COVID-19 are also relevant since differences only appear in the anxiety response due to the direct experimentation of symptoms. This is an aspect found in previous research (Justo-Alonso et al., 2020). However, in our study neither depressive vulnerability nor protective factors present differentiating keys, contrary to what is reported in other contexts (Cooke et al., 2020). There was neither any influence on the PTG, results that would be more dependent on other variables such as coping styles (Peters et al., 2021). Perhaps the controversy may be due to the moment of the pandemic in which the sampling was carried out, since in our case it occurred in an advanced period of the pandemic, unlike other studies have been carried out in its initial phases. This variability should be considered to establish the different response of the population considering the pandemic mortality rate and the perceived invulnerability (Xiang et al., 2020). In any case, further research is required.

Depression is the most determinant variable inhibiting resilience and life purpose which would lead to lower levels of PTG. This evidence is consistent with the multidimensional structure of PTG, which includes keys related to one's own identity, openness to others, and the spiritual key of meaning (Tedeschi & Moore, 2021). In contrast, the mediation of anxiety has a different weight when symptoms are present. Having symptoms increases anxious behavior

but also provides an opportunity for PTG. This is a result that does not coincide with most research, since their evidence points to the inhibitory role of PTG. However, the anxiety response could act as a mobilizer of the PTG if it is attributed to the existential nuance that has been specifically evaluated in previous research. Instead of acting as a brake on development, it would be a catalyst for non-avoidant coping cognitions and behaviors (Tomaszek & Muchacka-Cymerman, 2020).

After a traumatic experience it is important to include fundamental existential questions and the meaning of life. There are validated instruments assessing purpose in life with anxious and depressed Spanish patients (Armas-Arráez et al., 2018). Therefore, in both general and clinical population, the importance of the mediating effect of the severity of trauma symptoms on life satisfaction and existential anxiety and their associations with PTG should be considered. As mentioned, contextual variables and variables of vulnerability considering the pandemic moment should be controlled to enable specific keys that can explain the differences. In line with the relationship of the PTG with personality variables, the results are consistent in some clinical populations. In a study with people affected by HIV (Rzeszutek et al., 2017), of the big five personality traits, extraversion had the strongest relationship with PTG, as did life satisfaction. On the other hand, the relationship was inverse with neuroticism, due to the logic of the model and because of what has been pointed out about the ruminative differences between reminiscences of overcoming and stagnation. This work is important because it shows that these personality variables are more relevant to predict growth than medical clues. It is also interesting that the negative association between neuroticism and PTG appears 5 years after the start of antiretroviral treatment. This shows the need for follow-up studies in the case of COVID-19 to determine long-term effects. And, as we have previously pointed out, this work also corroborates the role of sociodemographic factors in satisfaction with life and PTG.

Regarding protective factors, life purpose is the variable that directly determines PTG, in line with previous literature (Chao et al., 2020; Lunansky et al., 2021). Resilience is also important in PTG, but its influence is mediated by life purpose. This is a key aspect to the extent that it would support the line that defends the independence of the resilience and PGT constructs (Tedeschi & Calhoum, 2007; Williams et al., 2021). However, it is necessary to contrast the consistency of the model with replicas of the sampling at later times and in different cultural and socio-health contexts. As stated by Jayawickreme et al. (2021), in addition to individual factors, the narrative approach of the PTG is decisively influenced by cultural dimensions. Thus, cultural scripts determine reconstructions and interpretations of traumatic events, such as the case of the COVID-19 pandemic. And referring to this socio-sanitary crisis, Koompai and Royer (2022), in a comparative study in 26 countries at the European level, analyzed six dimensions: quality of life, democracy and trust, work, finances, psycho-social support and medical care. The results found the following differences across countries; On the one hand, the Nordic countries, which have higher levels of tolerance for uncertainty (indulgence), presented higher levels of quality of life, despite the pandemic. In contrast, in Eastern Europe countries and the Mediterranean area (Italy, Spain and Greece), countries with higher power distance and uncertainty avoidance, the pandemic had an impact on quality of life results. This study shows differences in quality of life across European countries when facing a similar stressful event. Therefore, it is a necessary element when considering this contextual variable to understand both buffering and vulnerability responses to trauma.

The challenges for health systems are changing and it is necessary to advance in rehabilitative and protective keys permanently. If the PTG is a process of adaptation to the pandemic, all the factors that help positive reinterpretation and reframing will be effective health strategies. Finstad et al. (2021), in a narrative review on the positive aspects of trauma (resilience, coping strategies and PTG), concluded that resilience is a fundamental variable to reduce and prevent the negative psychological effects of the pandemic. And it is also associated with lower levels of depression, anxiety and burnout. Both at the individual and organizational level, resilience plays a crucial role in improving population´s well-being. Therefore, it is evident that resilience is a positive factor that influences the development of PTG.

Limitations

Some limitations should be considered for future work. First, this is a cross-sectional study, which does not allow causal relationships. It would be necessary to expand the results and their consistency using a longitudinal methodology. Second, we used a convenience and not probabilistic sample, which poses possible bias in terms of the representativeness of the Spanish population. Third, greater homogeneity in the sex distribution is needed, since the proportion of men is much lower. Finally, the sampling technique, online survey, may also imply a bias in the recruitment of participants since only those subjects who have digital skills and Internet access have been able to participate in the study.

Conclusion

Our study supports that the interrelation of mental health risk and protective variables maintain the positive and negative associations that have been evidenced in the pre-pandemic stage. However, not all of them are equally relevant to determine PTG and their differential weight is the original contribution of this work. We found that the depressive response is the most inhibitory variable of PTG, and life purpose is the most directly related variable to PTG. These two variables should be the therapeutic targets in interventions aimed at promoting responses focused on crisis coping strengths.

The second contribution of the results suggests that PTG is greater in women, not having found differences by age or marital status. Promoting PTG in men is needed, as occurs in other variables (e.g., emotional intelligence). In addition to emotional programs, those specifically focused on PTG keys (Self-perception, Relationships and Spirituality) should be developed.

The fitted model also stresses the need of focusing interventions on life purpose as a target. Direct mediation in the PTG counteracts the weight of depression and is favored by the anxiety associated with the stress caused by COVID-19. Fighting the existential vacuum is an additional source of resilience that also appears in the model. Interventions that promote adaptive coping strategies (reflecting on constructive questions, planning, practical support, or reformulation), as well as facilitating awareness of personal strengths and emphasizing the importance of social connections, along with purpose and meaning in life, is the path that leads to higher levels of PTG. Recognizing and identifying the specific role of risk and protective factors early enough will protect the population against future pandemics, reduce the risk of morbidity from post-traumatic stress disorder (PTSD) or secondary-traumatic-stress (STS), and promote personal growth.

Future research should confirm the causality of the associations found and the generalization of the results in other countries with different cultural schemes, social relationship styles and degrees of pandemic affectation.

Author Contribution ASC & CN designed the study and wrote the draft of the manuscript. JL & GPR, collected and prepared the data. CN & ASC designed the study and conducted the data analysis. ES & BBL gave special advice in the study design. JL, GPR, ES & BBL critically revised the manuscript for important intellectual contributions. All authors contributed to and have approved the final manuscript.

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Declarations

Conflict of interest No potential conflict of interest was reported by the authors.

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