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A Cross-Sectional Survey on the Relationship Between Spirituality and Posttraumatic Growth During the COVID-19 Pandemic: The Mediating Role of Emotion Regulation and Self-Compassion

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Abstract

Post-traumatic growth (PTG) refers to potential positive outcomes following exposure to trauma and may have been experienced during the COVID-19 pandemic. The present study investigated the mediating role of emotion regulation (cognitive reappraisal) and self-compassion in the relationship between spirituality and PTG. The sample comprised 700 patients with COVID-19 who were hospitalized during their illness at Hazrat-Rasoul Hospital in Tehran, Iran (395 males, mean age = 52 years, SD = 14, age range = 14–95 years). Data were collected using a questionnaire packet that included the Post-Traumatic Growth Inventory (PTGI), the Daily Spiritual Experience Scale (DSES), the Emotion Regulation Questionnaire (ERQ) and the Self-Compassion Scale (SCS). Structural equation modelling analysis supported the proposed model which indicated that spirituality both directly and indirectly associated with PTG through emotion regulation (cognitive reappraisal) and self-compassion. To test the indirect effects, bootstrap analysis was conducted with a 95% confidence interval and 5000 sample replacements. The results showed that spirituality influenced PTG through emotion regulation and self-compassion. The findings suggest that attention to these factors is crucial in facilitating the path to PTG.

Keywords Spirituality · Emotion regulation · Self-compassion · Post-traumatic growth · COVID-19

Introduction

The coronavirus disease 2019 (COVID-19) was declared a pandemic by World Health Organization (WHO) on 12 March 2020. In a short time, the disease spread throughout the world. At the time of writing (March 2024), and based on the World Health Organization (WHO) statistics, over 704 million people have been infected with COVID-19 and over seven million

people have died. In Iran (where the present study was carried out), the virus has infected over 7.6 million people and caused over 146,000 deaths (Ministry of Health and Medical Education of Iran, 2024).

The COVID-19 pandemic has had significant outcomes, not only for physical health but also for the mental health of the world population. A systematic review (Rogers et al., 2020) indicated that the pandemic will have long and short-term psychiatric consequences, and that depression, anxiety, fatigue, insomnia, and post-traumatic stress will probably increase between 6 weeks and 39 months after contracting the virus based on previous coronavirus epidemics. Other studies have identified critical psychological issues associated with the pandemic including depression and anxiety (Bueno-Notivol et al., 2021; Ma et al., 2020; Nikčević et al., 2021; Nikčević & Spada, 2020; Parker et al., 2020), acute stress disorder symptoms (Parker et al., 2020) post-traumatic stress disorder (Li et al., 2020), post-traumatic stress symptoms (Chen et al., 2020), suicidal ideation (Mamun et al., 2021), and psychological distress, burnout, and somatization (Salazar de Pablo et al., 2020).

Although traumatic events have negative psychological consequences, positive changes can be experienced after trauma, known as post-traumatic growth (PTG; Tedeschi & Calhoun, 2004). PTG refers to the positive experienced changes resulting from struggling with a highly challenging situation in life (Tedeschi & Calhoun, 1996). The overcoming of trauma enables individuals to recognize meanings in interpersonal relationships, feel more personal power, change their priorities, be grateful for small positive life events, and have a more prosperous spiritual life (Tedeschi & Calhoun, 2004).

Studies have confirmed that PTG is associated with hope, coping strategies, and social support (Brandão et al., 2020; Prati & Pietrantoni, 2009; Umer & Elliot, 2021). Some personality

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traits such as extraversion, openness to experience, agreeableness, and conscientiousness have also been positively associated with post-traumatic growth (Linley & Joseph, 2004). Predictors of PTG have included female gender (Vishnevsky et al., 2010), younger age and higher education (Linley & Joseph, 2004), pre-traumatic spirituality (Khursheed & Shahnawaz, 2020), use of cognitive reappraisal emotion regulation strategies (Zhou et al., 2016), and higher levels of self-compassion (Basharpoor et al., 2021).

Spirituality and post-traumatic growth

In the past two decades, the number of studies on the concept of spirituality has increased (Skrzypińska, 2014). Spirituality has been described as implicating the deepest questions about life's meaning in relation to the transcendent (Huguelet & Koenig, 2009). Moreover, spirituality has been described as "the yearning within the human being for meaning, for that which is greater than the encapsulated individual" (Thorne, 2001, p.438). Studies have illustrated spirituality as independent factor in PTG (e.g., Dilmaghani, 2018; Gesselman et al., 2017; Kira et al., 2021; Lucchetti et al., 2020; Roberto et al., 2020; Shattuck & Muehlenbein, 2020; Zarzycka & Puchalska-Wasyl, 2020; Zhang et al., 2021). Moreover, spirituality is positively associated with mental health factors like wisdom (Lee et al., 2020), effective coping (Krause et al., 2016), higher well-being (Zarzycka & Puchalska-Wasyl, 2020), lower depression (Braam & Koenig, 2019), higher self-efficacy (Sharma et al., 2017), and PTG (Gesselman et al., 2017; Sharma et al., 2017). However, there is a lack of knowledge concerning feasible mediators between spirituality and PTG.

Emotion regulation and post-traumatic growth

Emotion regulation refers to individuals' conscious and non-conscious efforts to influence emotions through strategies to decrease, conserve or enhance emotional expression and experience

to respond appropriately to the situations to achieve the desired goal (Gross, 2015; Tull et al., 2020; Werner & Gross, 2010; Zhou et al., 2016). The relationship between effective emotion regulation and PTG has been verified (Karimzadeh et al., 2021; Zhou et al., 2016). Orejuela-Dávila et al. (2019) observed that increased individual reappraisal choice predicted a higher level of PTG. In investigating the COVID-19 affected population, Jiang et al. (2020) found that more use of expressive suppression and less cognitive reappraisal related to the more significant PTSD symptoms. Siegel and Lahav (2021) showed that effective emotion regulation strategies play a critical role in the explanation of distress and trauma-related symptoms during the COVID-19 pandemic and associated with less distress and trauma.

Self-compassion and post-traumatic growth

Self-compassion is conceptualized as a striking balance between positive and negative self-responding in case of personal contention (Neff, 2003a; Neff et al., 2019). Self-compassion requires individuals being more gracious and supportive of themselves, and being less sharply judgmental. It entails understanding the common human experience of imperfection (Neff, 2003a; Neff et al., 2019; Braehler & Neff, 2020).

In some studies, self-compassion has been associated with higher levels of PTG (Khursheed & Shahnawaz, 2020; Wong & Yeung, 2017). Also, the association between self-compassion and decreased posttraumatic stress symptoms has been reported in previous studies (Barlow et al., 2017; Wong & Yeung, 2017). Self-compassion is an effective influential factor in reducing COVID-19 stress (Nguyen & Le, 2021). Gutiérrez-Hernández et al. (2021) examined the role of self-compassion during the COVID-19 lockdown in a study of approximately 900 Spanish adults in the general population. They found that higher levels of self-compassion were associated with lower levels of anxiety and depression, and self-compassion appeared to act as a protective

factor against the negative psychological consequences of a stressful event and reduced the likelihood of vulnerability to emotional disorders. Therefore, the primary aim of the present study was to investigate the role of self-compassion in the relationship between spirituality and PTG.

Potential mediators in the relationship between spirituality and post-traumatic growth

As aforementioned, the relationship between spirituality and PTG has been examined in some previous studies (Brelsford et al., 2020; Gesselman et al., 2017; Sharma et al., 2017). To the best of the present authors' knowledge, few studies have investigated potential mediators between spirituality and PTG (Khursheed & Shahnawaz, 2020). Spirituality can affect different dimensions of mental health such as improving coping styles (Krause et al., 2016) and lowering depression (Braam & Koenig, 2019).

It appears that spirituality may facilitate the emotion regulation process by limiting the variety of emotional experiences and their expression (Vishkin et al., 2019) and facilitating an integrated meaning system for reappraisal (Schnitker et al., 2017). The application of emotion regulation strategies (cognitive reappraisal and expressive suppression) may play role in helping PTG through reappraising pre-traumatic beliefs and assumptions, and attempting to reconstruct beliefs consistent with the traumatic experience (Larsen & Berenbaum, 2015). Therefore, emotion regulation strategies can be considered as a probable mediator between spirituality and PTG.

On the other hand, spirituality may lead to self-compassion through increasing personal tolerance capacity, searching for the meaning of personal suffering, and going beyond the boundaries of existence to accept novel beliefs and integrate them into existing schemas (Khursheed & Shahnawaz, 2020). Also, self-compassion may be related to PTG by developing the desire to obtain a positive attitude toward life experiences and using more adaptive coping to

challenge trauma experiences (Basharpoor et al., 2021). Consequently, self-compassion can be considered a probable mediator between spirituality and PTG.

Spirituality appears to facilitate the regulation of emotions by constraining the range of emotional experiences and their outward expression. Additionally, it contributes to an integrated meaning system that supports cognitive reappraisal. Emotion regulation strategies, such as cognitive reappraisal and expressive suppression, may serve as mediators in the relationship between spirituality and PTG. These strategies play a role in re-evaluating pre-traumatic beliefs and assumptions, thereby reconstructing beliefs consistent with the traumatic experience.

Conversely, spirituality may foster self-compassion by enhancing personal tolerance, seeking meaning in personal suffering, and transcending existential boundaries to embrace novel beliefs within existing cognitive frameworks. Self-compassion, in turn, correlates with PTG by fostering a positive attitude toward life experiences and promoting adaptive coping strategies in the face of trauma. Consequently, self-compassion emerges as a plausible mediator in the relationship between spirituality and PTG.

Based on the aforementioned literature, it is hypothesized that emotion regulation and self-compassion will be potential mediators in the relationship between spirituality and PTG in the context of the COVID-19 pandemic.

Aim of the present study

Despite the consistent association between spirituality and PTG in the extant literature, the probable mechanisms remain understudied (Khursheed & Shahnawaz, 2020). As aforementioned, the extant literature shows two possible candidate mediators: emotion regulation (Kira et al., 2020; Zhou et al., 2016) and self-compassion (Basharpoor et al., 2021; Khursheed & Shahnawaz, 2020)

which are both associated with spirituality and PTG. It was hypothesized that spirituality would be associated with PTG through both direct and indirect pathways by emotion regulation strategies and self-compassion among those who had been hospitalized due to COVID-19 (Figure 1). It was expected there would be a direct effect between spirituality and PTG and an indirect effect through emotion regulation as well as self-compassion among such individuals. Given the cross-sectional nature of the data, the present study also investigated an alternative model. In the second model, PTG was considered as the independent variable and spirituality as the dependent variable, while the other mediating variables in the alternative model remained unchanged (Figure 2).

Figures 1 and 2

Method

Participants and procedure

The participants comprised 700 patients (395 males; M_{age} = 52 years [SD=14]; age range=20-95 years; all Muslim) who had been hospitalized in ICU due to COVID-19 at the Hazrate-Rasul Hospital in Tehran. The details of potential participants were provided confidentially through the research department of the Iran Ministry of Health and Medical Education. After checking the willingness of the patients to participate, they were interviewed. It had been 6 to 12 months since they had been first infected with COVID-19. The time since the traumatic experience is associated with PTG, and the longer the period has passed since the trauma, the more likely the individual has of experiencing PTG (Waugh et al., 2018). Patients were invited to participate in the study and they completed the survey questions through telephone interviews. All participants were notified of the study purposes and provided informed consent before answering the survey questions and psychometric scales. The questions were asked in rotated order to control for order effects. After

providing informed consent and information about the research aims, the participants were assured that their demographic information would be kept confidential. They were informed that they could stop being asked questions whenever they wanted. All procedures performed in studies involving human participants were in accordance with national ethical standards and was approved by the Ethics Committee of Kharazmi University of Tehran, Iran (IR.KHU. REC.1400.015), and complied with the 1964 Helsinki Declaration and its later amendments.

Measures

All the measures were the Persian form of the original scales.

Sociodemographic information

In the present study, basic general sociodemographic information was asked for (i.e., age, marital status, education level, employment status, and gender).

Post Traumatic Growth Inventory (PTGI)

The 21-item PTGI (Tedeschi & Calhoun, 1996; Persian version: Heidarzadeh et al., 2015) was used to assess posttraumatic growth. The PTGI comprises five dimensions: relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. Items (e.g., *"I have a better understanding of spiritual matters"*) are rated on a six-point scale from 0 (*with no change*) to 5 (*with a high degree of change*). Total scores range from 21 to 105 and higher scores indicate greater posttraumatic growth. The Cronbach's alpha coefficient in the present study was .87.

Daily Spiritual Experience Score (DSES)

The 16-item DSES (Underwood & Teresi, 2002; Persian version: Taqavi & Amiri, 2010) was used to assess spirituality. Most items (e.g., *"I experience a connection to all of life"*) are rated on a six-point scale from 0 (*never or almost never*) to 6 (*many times a day*). The last item (*"In general, how close do you feel to God?"*) is rated differently (not close, somewhat close, very close, and as

close as possible). Total scores range from 16 to 96 and higher scores indicate greater spirituality. The Cronbach's alpha coefficient in the present study was 0.89.

Emotion Regulation Questionnaire (ERQ)

The 10-item ERQ (Gross & John, 2003; Persian version: Ghasempour et al., 2012) was used to assess emotion regulation. Six items assess the range of cognitive reappraisal (e.g., *"When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about"*), and four items assess the range of expressive suppression (e.g., *"I control my emotions by not expressing them"*) and are rated on a seven-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Total scores range from 10 to 70 and higher scores indicate greater emotion regulation strategy. The Cronbach's alpha coefficient in the present study was .72.

Self-Compassion Scale (SCS)

The 12-item short-form of the SCS (Neff, 2003b; Persian version: Forouqi et al., 2016) was used to assess self-compassion. Items are rated on a five-point scale ranging from 1 (*almost never*) to 5 (*almost always*). Six items are reversed scores (e.g., *"I'm disapproving and judgmental about my flaws and inadequacies"*). Total scores range from 12 to 72 and higher scores indicate greater self-compassion. The Cronbach's alpha coefficient in the present study was 0.64

Statistical analyses

First, to examine the association between latent variables, correlations were calculated. Second, the two-step process of Anderson and Gerbing (1988) was applied to test the proposed model. According to this method, the validity and reliability of research materials were first assessed by confirmatory factor analysis, then the proposed model was tested using structural equation modeling (SEM) with AMOS 23. The following index is frequently considered for appraising the model fit: comparative-fit index (CFI; good fit: ≥0.90); Normed Fit Index (NFI; good fit: ≥0.90);

Root Mean Square Error of Approximation (RMSEA; good fit: ≤0.06); Goodness of Fit Index (GFI; good fit: ≥0.90); Standardized Root Mean Square Residual (SRMR; good fit: ≤0.08); and Incremental Fit Index (IFI; good fit: ≥0.90) (Hu & Bentler, 1999). For testing the indirect effects, bootstrap analysis with 95% confidence interval and 5000 sample replacements was estimated.

Table 2.

Results

Preliminary analysis

As presented in Table 4, there was no multicollinearity between variables (r<0.85; Kline, 2011). Table 5 shows the chosen marker for each factor. The kurtosis index was between -0.81 and 1.44 which is acceptable according to Kline (2011). The skewness index was between -1.02 and -.3 which is acceptable according Hu et al. (1995). Means, standard deviations, and correlations between variables are shown in Table 4 and Table 5 to illustrate inter-item covariance. Results showed positive correlations between spirituality and the mediators. Additionally, all mediators were significantly correlated with PTG.

Mediation analysis for Model 1 and Model 2

As aforementioned, an alternative model with changed independent and dependent variables was tested. Model fit indexes and bootstrap estimations can be found in Tables 2 and 3. In Model 1, spirituality was the independent variable and PTG was dependent variable (Figure 1). In Model 2, PTG was the independent variable and spirituality was the dependent variable (Figure 2). The SEM model results verified an appropriate fit for Model 1 (χ^2= 2597/236, RMSEA= 0.034, GFI= 0.89, AIC= 2827.236, BIC= 3350.446). Model 1 explained 29% of the variance of PTG (see Table 6). In relation to Model 1 (Figure 3 and Table 6), spirituality related to cognitive reappraisal (β =0.74, t = 3.3, p< 001) and self-compassion (β = 0.17, t = 0.69, p=0.49). Also, cognitive reappraisal (β =

0.27, $t = 4.78$, $p<001$) and self-compassion (β = -0.04, t = -2.25, $p=0.025$) related to PTG. The direct association between spirituality and PTG ($\beta = 0.37$, $t = 3.41$, $p<0.001$) was also significant.

(Tables 5 and 6, and Figure 3)

The SEM model results also verified an appropriate fit for Model 2 ($\chi^2= 2596/316$RMSEA $= 0.034$, GFI$=0.87$, AIC$= 2826.316$, BIC$= 3349.526$). Model 2 explained 11% of the variance of spirituality (see Table 7). In relation to Model 2 (Figure 4 and Table 7), PTG related to cognitive reappraisal ($\beta =0.55$, $t = 5.73$, $p< 001$) and self-compassion (β = -0.21, $t = -2.30$, $p=0.022$). Also, cognitive reappraisal ($\beta = 0.16$, $t = 2.02$, $p= 0.043$) and self-compassion ($\beta = 0.04$, t = 1.14, $p=0.256$) related to spirituality. The direct association between PTG and spirituality ($\beta = 0.33$, $t = 4.22$, $p<0.001$) was also significant.

(Table 7, and Figure 4)

There was no significant difference between fit indices of Model 1 and Model 2. For Model 1, bootstrap analysis with 95% confidence interval and 5000 sample replacements showed that the indirect effect estimate was 0.107 (0.04 low confidence interval, 0.2 high confidence interval, and 0.002 for two-tailed). For Model 2, the bootstrap analysis showed that the indirect effect estimate was 0.059 (-0.028 low confidence interval, 0.153 high confidence interval, and 0.169 for two-tailed).

In summary, the statistical results of these two models were as follows: (i) Model 1 and Model 2 did not differ significantly in terms of fit indices (although Model 1 was slightly better), (ii) in terms of predictive power, Model 1 explained 29% of the variance of the dependent variable while Model 2 only explained 11% of the dependent variable, and (iii) the results of the bootstrap analysis which examined the mediating role of self-compassion and emotion regulation in both

models demonstrated that the proposed mediators in Model 1 had a mediating role, but for Model 2, these variables did not confirm they had a mediating role.

Discussion

The present study investigated the relationship between spirituality and PTG, through emotion regulation and self-compassion. The study comprised individuals hospitalized due to a COVID-19 diagnosis and it had been between 6 and 12 months since they were hospitalized. The study developed a model to clarify possible associated factors of PTG among a population of COVID-19 infected hospital patients. The association between spirituality and PTG through indirect pathways in the proposed conceptual model was confirmed (see Figure 1).

The association between spirituality and PTG

Consistent with previous findings (e.g. Brelsford et al., 2020; Khursheed & Shahnawaz, 2020; Schultz et al., 2010), the results of the present study affirmed the strong association between spirituality and PTG. Tedeschi and Calhoun (2004) reported that spirituality plays a critical role in the path to achieving PTG. It can be effective by improving social support and facilitate meaning-making. Trauma victims need new meanings and beliefs to rebuild the schemas and to use their spiritual meaning system. Brelsford et al. (2020) found in a study of parents whose infants were hospitalized in an intensive care unit that parents' spirituality was associated with higher levels of PTG and lower levels of anxiety. Parents who can perceive the parent-child relationship as a sacred one and consider God as part of that relationship experience higher PTG. Also, parents who see God as a present and supportive being reported lower levels of anxiety and higher levels of PTG. These findings are extended by the results of the present study which suggest that spirituality may

influence PTG through potential pathways such as cognitive reappraisal, expressive suppression, and self-compassion.

The mediating role of emotion regulation in the relationship between spirituality and PTG

In line with some previous studies (e.g., Kira et al., 2019; Orejuela-Dávila et al., 2019) the findings of the present study support the idea that cognitive reappraisal and expressive suppression are associated with PTG. A novel finding of the present study is that emotion regulation strategies (cognitive reappraisal and expressive suppression) appear to mediate the relationship between spirituality and PTG. The search for meaning is one of the most critical stages of PTG (Tedeschi & Calhoun, 2004) and cognitive reappraisal refers to making a change in the perceived meaning of an emotional event (Gross & John, 2003). Meaning-making is also one of the main concerns of religion and spirituality, and therefore a high level of spirituality is associated with greater use of cognitive reappraisal (Davies, 2011; Watts, 2007). Consequently, victims operate cognitive reappraisal to rebuild the schemas and find the meaning of that trauma, and spirituality supplies the possible beliefs.

Some aspects of religiosity and spiritual belief related to abstinence and asceticism limit the diversity of an individual's emotional experiences and how they occur. In this sense, they are associated with expressive suppression (Vishkin et al., 2019). Also, spiritual individuals are encouraged to promote self-control in dealing with traumatic events and to be patient and calm, to the extent that spiritual individuals are more inclined to suppress their emotional expressions (Vishkin et al., 2014). On the other hand, according to Tedeschi and Calhoun (2004), expressing trauma-related emotions to friends and supportive social networks plays a critical role in developing the PTG process. Individuals who use expressive suppression, repress their expression of emotions and thereby block the processing of trauma-related emotions. The use of expressive

suppression prevents the combination and absorption of new thoughts and emotions in the narrative of an individual's life and inhibits the PTG experience (Kira et al., 2019). Also, individuals who use a more expressive suppression strategy experience more frustration, have a deterministic attitude, and see themselves as victims of the traumatic event. This approach prevents the tendency to seek meaning and achieve PTG after trauma (Aliche et al., 2020).

The mediating role of self-compassion in the relationship between spirituality and PTG

Surprisingly, in contrast to several previous studies (e.g., Basharpoor et al., 2021; Wong & Yeung, 2017), a negative mediating role was found for self-compassion. Spirituality is largely about increasing the capacity for personal tolerance, searching for the meaning of personal suffering, and transcending one's existential boundaries to accept new definitions and integrate them into previous schemas, all of which lead to self-compassion (Khursheed & Shahnawaz, 2020). According to Tedeschi and Calhoun (2004), to progress on the path of PTG, the perceived distress after encountering the trauma must be so great as to disrupt the previous semantic system and schemas so that the individual begins to search for meaning. However, individuals with a high level of self-compassion normalize the traumatic event and view the experience as a common human experience. This approach prevents existing beliefs and schemas from being challenged. Also, self-compassion acts as a buffer against anxiety and negative thoughts (Mowlaie et al., 2017). Moreover, rumination acts as a driving force to achieve PTG and creates questions that survivors ask themselves in an effort to find answers and meaning.

Another possible explanation for this unexpected result may be attributed to the Self-Compassion Scale. Critics of this self-report scale argue that items assessing self-judgment, isolation, and over-recognition of suffering are included as reverse items in the three components of self-kindness, human commonalities, and mindfulness which can form different factors and

inadvertently enter new dimensions or unwanted variance into the scale (Montero-Marin et al., 2018; Wong et al., 2003). Also, the face validity of the Self-Compassion Scale has shown that while compassionate items are considered positive cognitive coping aspects and healthy psychological functioning, non-compassionate items are mainly seen as indicators of vulnerability, symptoms of psychopathology, and psychiatric disorders (Muris et al., 2018). Therefore, the Self-Compassion Scale includes several dimensions differently related to external structures (Brenner et al., 2017; López et al., 2015; Muris et al., 2018). It should be noted that problems with using this scale are usually evident when used as a predictor of psychological variables (Muris & Otgaar, 2020).

Limitations, directions for future research, and implications

Inevitably the present study includes some limitations that should be considered when interpreting the findings. The cross-sectional nature of the study prevents the determination of causality between the study variables. Also, the present study utilized self-report measures which may have biased the results. Another limitation is the lack of control of influential factors like age and gender. Moreover, the sample may not have been representative of hospitalized COVID-19 patients and the patients may not have experienced their hospitalization as traumatic. The use of telephone interviews to collect data may have also influenced participant's responses. Finally, all participants were Muslims and their spiritual beliefs can be affected by their religion. Therefore, there may issues concerning the generalizability of the findings in relation to these data. Despite these limitations, the present study is important in helping to clarify the possible mediators to predict PTG. For future research, longitudinal studies controlling for sociodemographic factors like age and gender are needed, and the assessment of comorbid disorders like pre-traumatic depression and anxiety should be taken into consideration and formally assessed. Studying other populations

with religious groups other than Muslims is warranted. The present study, together with the findings of other studies, suggest that spirituality-based interventions should be applied to reduce suffering after encountering the trauma, decrease the risk of psychiatric disorders, and increase the likelihood of experiencing PTG.

The present study, along with others, suggests that specific interventions need to be implemented to reduce suffering following trauma, such as severe COVID-19 infection, in order to enhance the potential for PTG. The results could have significant clinical implications regarding the experience of PTG. Strengthening spiritual beliefs in the trauma context can directly enhance individuals' capacity to experience PTG and indirectly, through increased self-compassion and emotional regulation capacities, create a foundation for increasing the likelihood of PTG experience.

Conclusion

A novel mediating model between spirituality and PTG was proposed in the present study. The mediating role of emotion regulation and self-compassion were assessed. Results showed that cognitive reappraisal and expressive suppression were associated with PTG and self-compassion negatively mediated the association. Also, the results of the present study showed that the variables proposed in the conceptual model were able to predict 35% of the variance of PTG. Although the variables of cognitive reappraisal, expressive suppression and self-forgiveness play a mediating role in the relationship between spirituality and PTG, their mediating role was relative and the direct relationship between spirituality and PTG was still significant. The finding suggests that

interventions to encourage cognitive reappraisal, expressive suppression, and self-compassion should be implemented to facilitate PTG.

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Table 1

Sociodemographic data of the sample (n=700)

		N	%
Gender	Female	305	43.57
	Male	395	56.43
	Total	700	100
Educational level	Under diploma	257	36.71
	Diploma	173	24.71
	Advanced diploma	44	6.28
	Bachelor	140	20
	Master	57	8.15
	PhD	29	4.15
Employment status	Employed	313	44.71
	Unemployed	240	34.29
	Retired	147	21
Marital status	Married	562	80.29
	Unmarried	138	19.71
Age (in years)	20-60	472	67.43
	Over 60	228	32.57

Table 2

Test of indirect effects in mediation models using bootstrap analysis with 95% confidence interval

		Confidence Interval		
	Estimate	Low	High	Two-tailed
Model 1	.107	.04	.20	.002
Model 2	.059	-.028	.153	.169

Note. Unstandardized coefficients reported. Bootstrap sample = 5000 with replacement.

Table 3

Comparison model fit indexes between two models

	AIC	BIC	GFI	RMSEA
Model 1	2827.236	3350.446	.89	.034
Model 2	2826.316	3349.526	.87	.034

Note: AIC= Akaike information criterion; BIC= Bayesian information criterion; GFI= Goodness of fit index; RMSEA= Root mean square error of approximation.

Table 4

Mean, Standard deviation, skewness, kurtosis and zero-order correlations between the study variables (n=700)

Variable	Mean	SD	Skewness	Kurtosis	1	2	3	4
1. SP	4.56	0.84	-1.02	1.44	1			
2. CRE	5.05	1.05	-0.8	0.34	0.288**	1		
3. SC	3.55	0.64	-0.42	0.002	0.18**	0.223**	1	
4. PTG	2.6	0.52	-0.64	0.85	0.325**	0.439**	0.38	1

Note. SD= standard deviation; SP= spirituality; CRE= cognitive reappraisal; ESU= expressive suppression; SC= self-compassion; PTG= posttraumatic growth. $^*p<0.05$, $^{**}p<0.01$

Table 5

Non-standardized coefficients, standardized coefficients and t-values of the variables in the measurement model (n=700)

Variable	Non-standardized coefficients	Standardized coefficients	*t*-value	*p*-value
Spirituality				
DSES 1	3.61	0.70	5.74	***
DSES 2	3.56	0.57	5.62	***
DSES 3	4.81	0.73	5.84	***
DSES 4	4.88	0.71	5.76	***
DSES 5	4.88	0.77	5.75	***
DSES 6	2.91	0.49	5.26	***
DSES 7	4.37	0.82	5.93	***
DSES 8	5.28	0.81	5.94	***
DSES 9	4.70	0.82	5.88	***
DSES 10	4.43	0.66	5.44	***
DSES 11	4.18	0.55	5.76	***
DSES 12	3.06	0.55	5.64	***
DSES 13	2.66	0.43	5.18	***
DSES 14	1.17	0.15	2.80	0.005
DSES 15	4.06	0.72	5.80	***
DSES 16	1	0.25	-----	-----
Cognitive reappraisal				
ERQ 1	1	0.38	-----	-----
ERQ 3	1.24	0.43	5.69	***
ERQ 5	1.47	0.56	6.19	***
ERQ 7	1.57	0.56	6.52	***
ERQ 8	1.31	0.53	5.99	***
ERQ 10	1.21	0.48	5.93	***
Self-compassion				

Variable	Non-standardized coefficients	Standardized coefficients	*t*-value	*p*-value
SCS 1	1	0.69	-----	-----
SCS 2	-0.30	-0.24	-4.63	***
SCS 3	-0.18	-0.15	-2.72	0.006
SCS 4	0.95	0.64	11.74	***
SCS 5	-0.26	-0.22	-4.03	***
SCS 6	0.30	0.03	0.54	0.588
SCS 7	0.01	0.01	0.26	0.798
SCS 8	0.85	0.58	10.92	***
SCS 9	0.78	0.53	10.39	***
SCS 10	-0.31	-0.21	-4.29	***
SCS 11	0.33	0.22	4.30	***
SCS 12	0.81	0.54	10.00	***
Posttraumatic growth				
PTGI 1	1	0.38	-----	-----
PTGI 2	0.84	0.40	6.55	***
PTGI 3	1.24	0.49	7.67	***
PTGI 4	1.01	0.42	6.32	***
PTGI 5	1.48	0.63	7.54	***
PTGI 6	1.38	0.49	6.45	***
PTGI 7	1.40	0.52	7.63	***
PTGI 8	1.83	0.65	7.27	***
PTGI 9	1.24	0.49	6.77	***
PTGI 10	1.38	0.64	7.20	***
PTGI 11	1.31	0.60	7.14	***
PTGI 12	0.85	0.53	6.92	***
PTGI 13	1.43	0.67	7.55	***
PTGI 14	1.49	0.55	7.62	***
PTGI 15	1.33	0.63	7.20	***
PTGI 16	1.48	0.66	7.45	***
PTGI 17	1.16	0.59	7.15	***
PTGI 18	1.38	0.59	6.97	***
PTGI 19	0.96	0.41	6.08	***
PTGI 20	1.51	0.59	6.90	***
PTGI 21	1.37	0.57	6.85	***

*** $p<0.001$.

Table 6

Direct effect among latent variables In Model 1 (n=700)

Independent variables	Dependent variables	B	t	SE	p	R^2
SP	CRE	0.74	3.30	0.226	***	0.064
SP	SC	0.17	0.69	0.251	0.490	0.001
SP	PTG	0.37	3.41	0.108	***	0.286
CRE	PTG	0.27	4.78	0.057	***	
SC	PTG	-0.04	-2.25	0.018	0.025	

Note. SP= spirituality; CRE= cognitive reappraisal; SC= self-compassion; PTG= posttraumatic growth; SE = standard error; R^2 = coefficient of determination; *** $p<0.001$.

Table7

Direct effect among latent variables In Model 2 (n=700)

Independent variables	Dependent variables	B	t	SE	p	R^2
PTG	CRE	0.55	5.73	0.096	***	0.246
PTG	SC	-0.21	-2.30	0.090	0.022	0.014
PTG	SP	0.33	4.22	0.078	***	0.111
CRE	SP	0.16	2.02	0.078	0.043	
SC	SP	0.04	1.14	0.037	0.256	

Note. SP= spirituality; CRE= cognitive reappraisal; SC= self-compassion; PTG= posttraumatic growth; SE = standard error; R^2 = coefficient of determination; *** $p<0.001$.

Figure 1

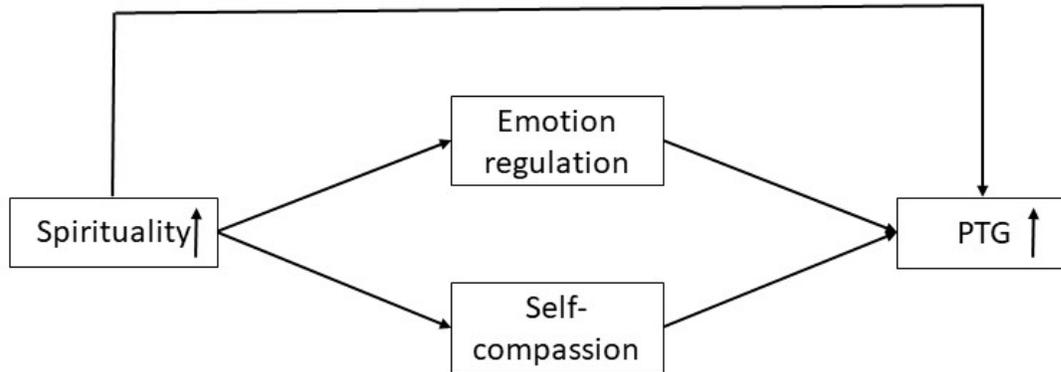*Proposed conceptual model for the relationship between spirituality and posttraumatic growth*

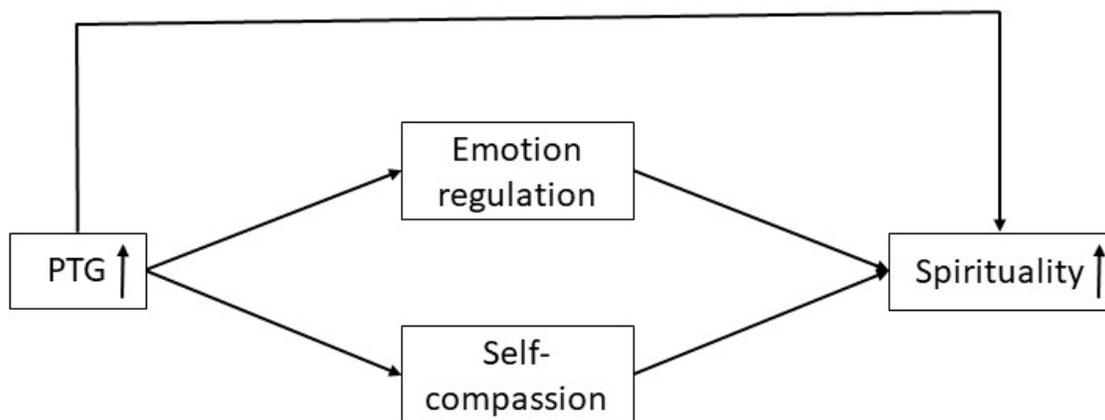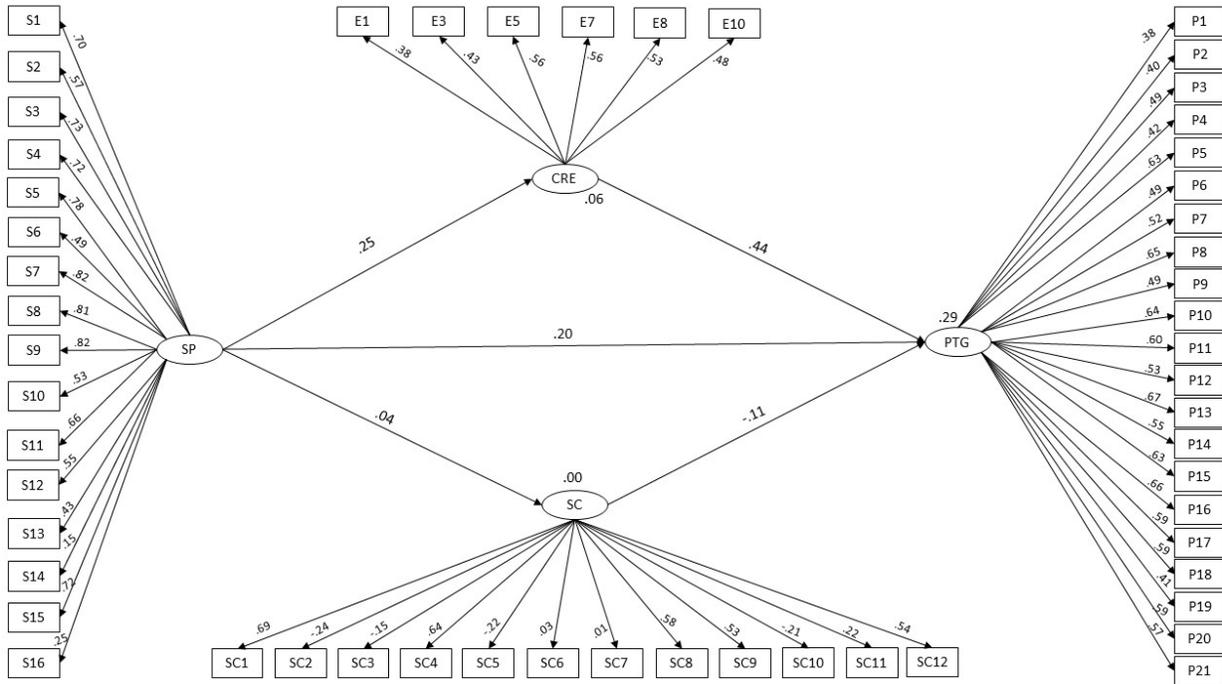**Figure** *2*
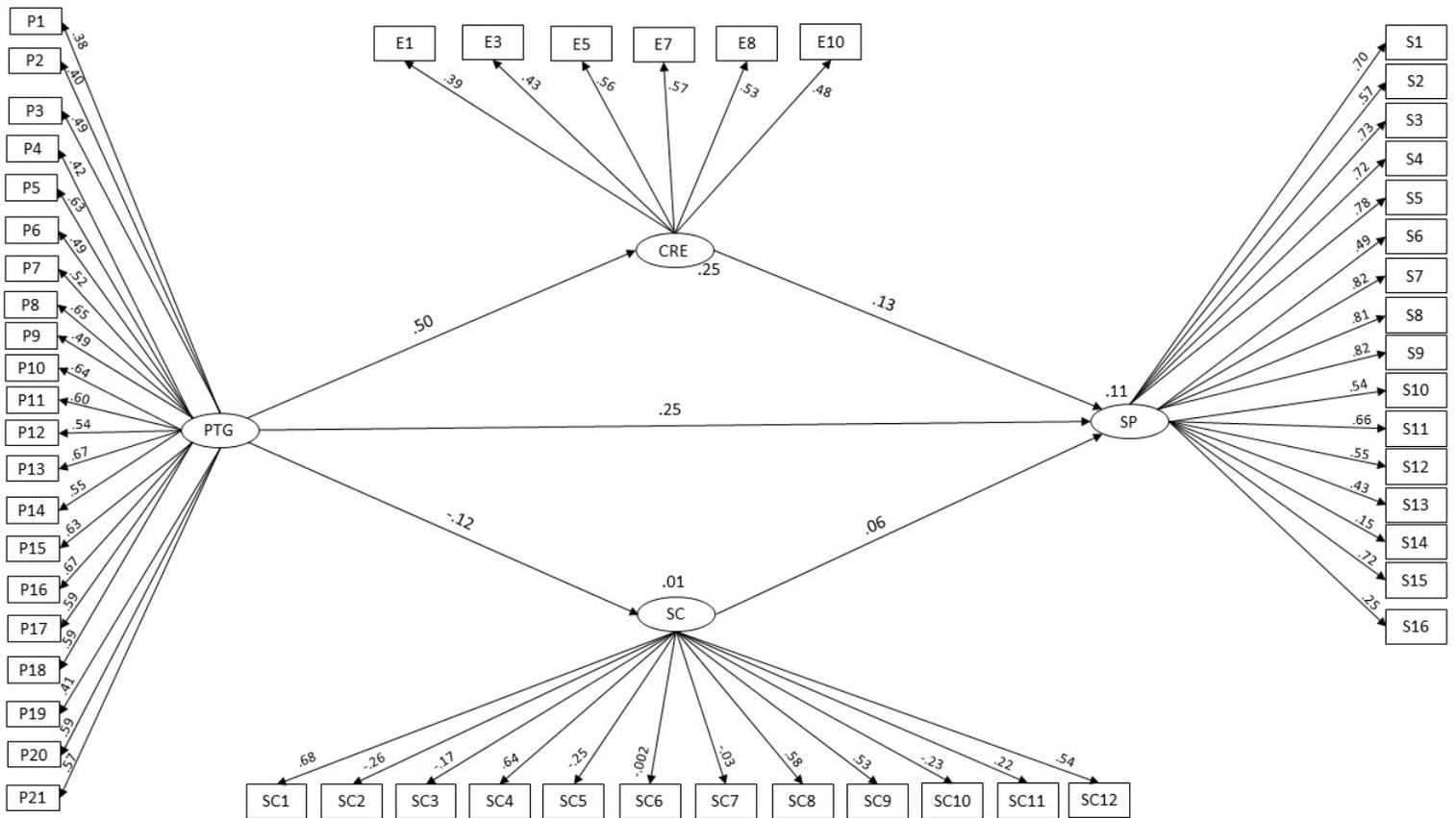
Alternative proposed model

Figure *3*

Structural equation model: direct and indirect pathways between spiritualty and PTG through emotion regulation and self-compassion.

Note. This structural model illustrates the relationship between spirituality and posttraumatic growth, with mediating effects of emotion regulation and self-compassion. Statistics are standardized regression coefficients. Bold numbers represent squared multiple correlation coefficients. CRE = Cognitive Reappraisal; SC = Self-Compassion; PTG = Post Traumatic Growth; SP = Spirituality; S = Spirituality Questionnaire; E = Emotion regulation Questionnaire; SC = Self-Compassion questionnaire; P = Posttraumatic Growth Questionnaire.

Figure *4*

Structural equation model: direct and indirect pathways between PTG and spiritualty through emotion regulation and self-compassion.

Note. This structural model illustrates the relationship between PTG and spirituality, with mediating effects of emotion regulation and self-compassion. Statistics are standardized regression coefficients. Bold numbers represent squared multiple correlation coefficients. CRE = Cognitive Reappraisal; SC = Self-Compassion; PTG = Post Traumatic Growth; SP = Spirituality; S = Spirituality Questionnaire; E = Emotion Regulation Questionnaire; C = Self-Compassion Questionnaire; P = Posttraumatic Growth Questionnaire.