Original Article

The relationship between mental health and perceived social support with the post traumatic growth model through the mediating role of coping strategies in COVID-19 recovered patients

Elnaz Deldadeh Mehraban [ID], Abdolhassan Farhangi*[ID], Shahnam Abolghasemi[ID]

Department of Psychology, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran

*Corresponding Author: Abdolhassan Farhangi, PhD; Tel:+98-11-57272897, Fax:+98-11-54274409, Email: abdolhasanfarhangi@gmail.com

Abstract

Background and aims: Coronavirus disease 2019 (COVID-19) is viewed as a traumatic incident that impacts many aspects of a person's life. The present study aimed to investigate the association of perceived social support and mental health with the post-traumatic growth model through the mediating role of coping strategies in COVID-19 recovered patients.

Methods: This study was conducted using a path analysis method from the correlation matrix. The study population included all COVID-19 recovered patients in Golestan province, Iran. Using the convenience sampling method, 300 patients who recovered from COVID-19 were selected. The study instruments included the Post-Traumatic Growth Inventory, the General Health Questionnaire, the Multidimensional Scale of Perceived Social Support, and the Ways of Coping Questionnaire. The data were analyzed through structural equation modeling using SPSS and AMOS version 25.

Results: The findings revealed that the suggested model fit the data. The relationship of post-traumatic growth, perceived social support, and mental health with problem-focused coping strategies was positive and significant ($P<0.01$). Likewise, the relations of mental health and perceived social support with post-traumatic growth were positive and significant. Post-traumatic growth and perceived social support had a negative and significant relationship with emotion-focused strategies ($P<0.01$). However, the relationship between mental health and emotion-focused strategies was not significant.

Conclusion: Mental health, perceived social support, and problem-focused strategies played an essential role in COVID-19 patients' post-traumatic growth. As a result, they might help minimize the psychological impact of COVID-19.

Keywords: Mental health, Posttraumatic growth, Social support, Coping behavior, COVID-19

Introduction

Coronaviruses are a diverse group of viruses that range from the common cold virus to the source of more dangerous infections such as severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and coronavirus disease 2019 (COVID-19) (1,2). COVID-19, the most recent of these viruses, caused a human pandemic in Wuhan, China, in December 2019 (3,4). Since COVID-19 is risky for those who are diagnozed with it, its diagnosis may have a negative impact on the patients' mental state (5). Cao et al (6) conducted a study titled "the psychological impact of the COVID-19 epidemic on college students in China", discovering that 24% of the participants experienced anxiety. Since the patients' mental state might impact their physical health, it is important to investigate the factors that influence their psychological state.

Experiencing a traumatic event or a serious loss may result in certain advantages such as reconstructing the experience and positive changes in life perspectives, which is referred to as post-traumatic growth (7). According to the post-traumatic growth model, for example, post-injury automatic rumination might develop into the deliberate ruminating process. Continuity of automatic thoughts may serve as the initial stage for a search to determine the impact of a stressful events on a person and aid the individual in understanding the fundamental meaning of stress (8,9). Previous studies have proved that post-traumatic growth is effective in healing the emotional and even physical condition of sufferers with burn injuries, heart disease, and cancer (10-13). As a result, identifying the predictors of post-traumatic growth is crucial since they help improve the patient's physical and mental health (14,15). Kim et al (16) demonstrated that social support is a factor that has a positive and significant relationship with post-traumatic growth in male patients with rectal cancer.

When confronted with a stressful situation, people use a variety of coping strategies. Effective coping strategies may mitigate the impacts of stress and minimize the short- and long-term consequences of anxiety (17). These strategies are cognitive and behavioral efforts that aid the individual in managing psychological and physiological needs under stressful circumstances (18,19). Stress is managed by concentrating on oneself and decreasing unpleasant emotions or experiences through these strategies (20). Mental health is a significant factor for those recovering from COVID-19. It refers to having a compatible behavior as a part of society, understanding and accepting social realities, adjusting to these realities, and meeting one's balanced needs (21,22). Mental health is an essential factor in community members' general health (23). People suffering from various illnesses often lack adequate mental health, and this problem predicts high levels of perceived stress, poor self-efficacy, short life expectancy, severe physical symptoms, depression, severe anxiety, and low social functionality (24,25).

Perceived social support is one of the most helpful variables in treating mental illnesses caused by COVID-19 (26). People's perceptions of their popularity or respect are the basis of social support. Perceived social support refers to the degree to which people sense affection and support from family, friends, and others in the face of stress or trauma (27). According to Ebrahim and Alothman (28), there is a positive and significant relationship between perceived social support and resilience with post-traumatic growth. Because of the rising frequency of COVID-19 over the world and the physical, psychological, and social stresses on individuals who recover from COVID-19, it is essential to carry out investigations on these patients. Understanding the coping strategies among patients who have recovered from COVID-19 may assist minimize pressure among the recovered, enhance their mental health, and boost their perceived social support. Therefore, based on the above considerations, the present study aimed to investigate the relationship of mental health and perceived social support with the post-traumatic growth model through the mediating role of coping strategies in COVID-19 recovered patients in Golestan province, Iran.

Materials and Methods

The correlational method was employed to accomplish the objectives of the study, and the hypotheses were tested using path analysis modeling. The study population included all COVID-19 recovered patients in Golestan province, Iran. Using the convenience sampling method, 300 patients who recovered from COVID-19 were selected. Online research questionnaires were designed, uploaded to a credible website, and distributed to participants. Inclusion criteria were as follows: improved COVID-19 participants, conscious agreement to participate in the research, age range of 20-60 years, no mental problems, and no use of psychiatric medications. The exclusion

criterion included failing to respond to questions. Ethical considerations were provided in this study by obtaining informed written consent. Participants were also offered the option of dropping out of the study. After consulting with the research unit and obtaining the necessary permit, sampling was carried out. The researcher analyzed the data confidentially.

Research instruments

Post-Traumatic Growth Inventory: Tedeschi and Calhoun developed the Post-Traumatic Growth Inventory in 1996 to examine the beneficial results experienced by individuals with a history of trauma. This questionnaire encompasses 21 items graded on a 6-point Likert scale, with a score of 0 (not at all), 1 (very low), 2 (low), 3 (medium), 4 (high), and 5 (very high). Tedeschi and Calhoun (29) reported an internal consistency of 0.90 for this questionnaire. Further, Heidarzadeh et al (30) reported a Cronbach's alpha of 0.81 for the questionnaire. In this study, the Cronbach's alpha coefficient of this questionnaire was 0.84.

General Health Questionnaire: Goldberg and Hiller designed the General Health Questionnaire in 1979 (31). This questionnaire consists of 28 items rated on a four-point Likert scale ranging from strongly disagree to strongly agree. The higher the score, the better mental health will be experienced by individuals (31). The reliability of this scale was estimated to be 0.91 (32), and its Cronbach's alpha was determined to be 0.87 in the present study.

Multidimensional Scale of Perceived Social Support: Zimet et al (33) developed the Multidimensional Scale of Perceived Social Support, which gives a subjective evaluation of social support adequacy. The scale consists of 12 questions that evaluate the participant's opinion of social well-being in family, friends, and other important people. Its scoring ranges from completely disagree (1) to completely agree (5). Higher scores imply higher levels of perceived social support. The authors reported the reliability of this tool to be 0.89 (34). The Cronbach's alpha coefficient of this questionnaire was 0.85 in the present study.

The Ways of Coping Questionnaire: Lazarus and Folkman in 1988 designed this questionnaire which consists of 66 questions that evaluate the two primary subscales of problem-based and emotion-based coping. It is graded on a 5-point Likert scale (1 to 5). The higher the score in each coping style, the more often that style is used by participants and vice versa. Internal consistency ranged from 0.66 to 0.79 for each of the coping strategies according to Lazarus. The reliability of the Ways of Coping Questionnaire was estimated to be 0.87 (35). In the present study, Cronbach's alpha was calculated to be 0.82.

Statistical analyses

Data were analyzed via descriptive and inferential statistics

such as mean, standard deviation (SD), and Pearson correlation coefficient. In order to evaluate the fitness of the model, the data were analyzed through structural equation modeling using SPSS and AMOS version 25. All statistical analyses were performed at the 0.05 level of significance.

Results

Findings relating to demographic variables revealed that 22.33% were under 25 years old, 37.33% were 25 to 35 years old, 27.33% were 35 to 45 years old, and 13.01% were over 45 years old. Furthermore, 52.67% of the participants were male, while 47.33% were female. In addition, 49% had a high school diploma, and 51% had a university degree. The mean, SD, and correlation between the research variables are presented in Table 1. Figure 1 represents the original suggested model to describe the relationship between the variables.

The results in Table 2 demonstrated that the original model has to be modified based on the root-mean-square error (0.176). In order to correct the model, the

insignificant relationship between mental health and emotion-focused coping was removed. There was a root-mean-square error (0.023) in the final model, indicating that the model fits well. Figure 2 shows the final modified model.

Table 3 presents the results of estimating path coefficients for testing direct hypotheses. The results revealed a direct relationship between mental health and problem-focused coping ($\beta=0.51$; $P=0.001$) and between mental health and post-traumatic growth model ($\beta=0.50$; $P=0.003$) in the COVID-19 recovered patients. Further, there was a direct relationship between perceived social support and problem-focused coping ($\beta=0.44$; $P=0.002$) and between perceived social support and the post-traumatic growth model ($\beta=0.59$; $P=0.001$) in the COVID-19 recovered patients. Moreover, there was a direct relationship between problem-focused coping and the post-traumatic growth model ($\beta=0.48$; $P=0.001$). However, there was a negative relationship between perceived social support and emotion-focused coping ($\beta=-0.47$; $P=0.011$) and between emotion-focused coping and post-traumatic growth model ($\beta=-0.51$; $P=0.006$) in the COVID-19 recovered patients. Finally, there was no significant relationship between mental health and emotion-focused coping in the

Table 1. Mean (SD), and Pearson correlation coefficients of the studied variables

Variables	Mean (SD)	1	2	3	4
1- Mental health	62.16 (12.14)	1			
2- Perceived social support	29.17 (8.12)	0.49**	1		
3- Coping strategies	121.43 (25.17)	-0.31**	0.45**	1	
4- Post-traumatic growth model	44.65 (12.33)	0.42**	0.29**	0.57**	1

Note. SD: Standard deviation.
** *P*<0.01.

Table 2. Fit Indicators of the Initial and Final Models

Fit indicators	χ²	df	(χ²/df)	IFI	TLI	CFI	NFI	RMSEA
Initial model	2.28	1	2.27	0.54	0.53	0.62	0.62	0.176
Final model	4.67	2	2.34	0.93	0.92	0.94	0.93	0.023

Note. df: Degree of freedom; IFI: Incremental fit index; TLI: Tucker-Lewis index; CFI: Comparative fit index; NFI: Normed-fit index; RMSEA: Root mean square error of approximation.
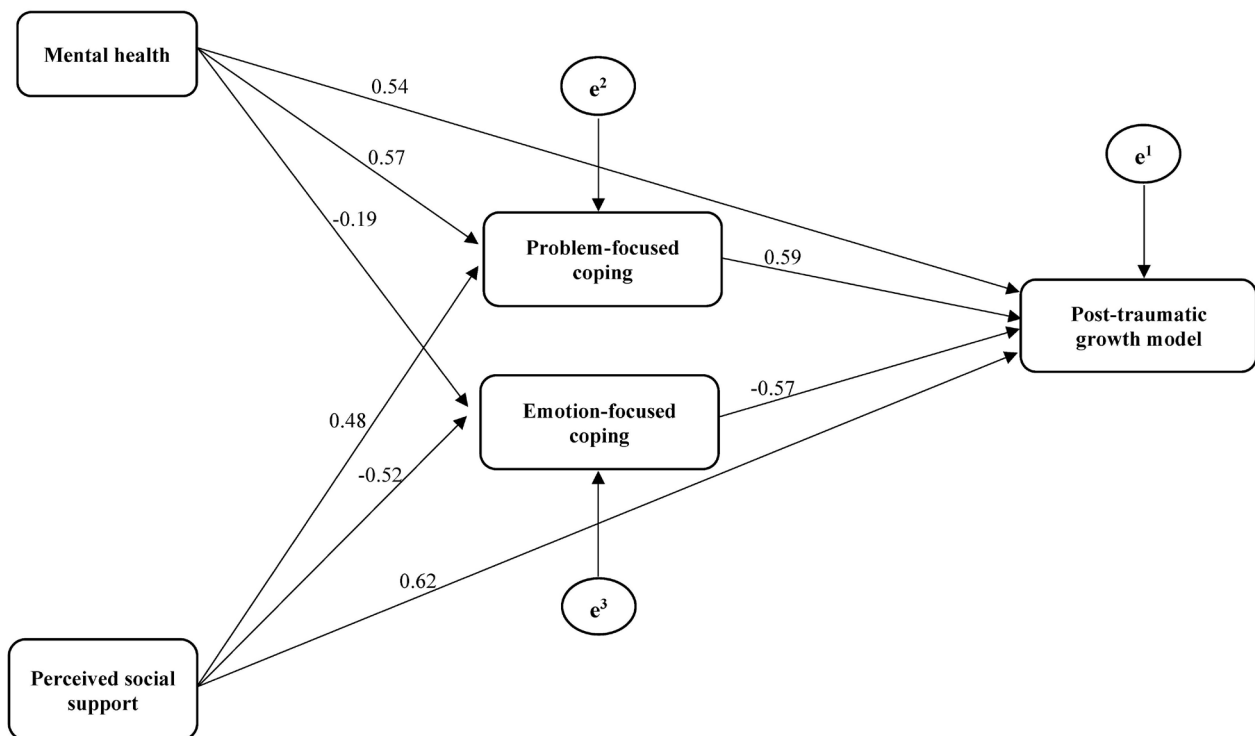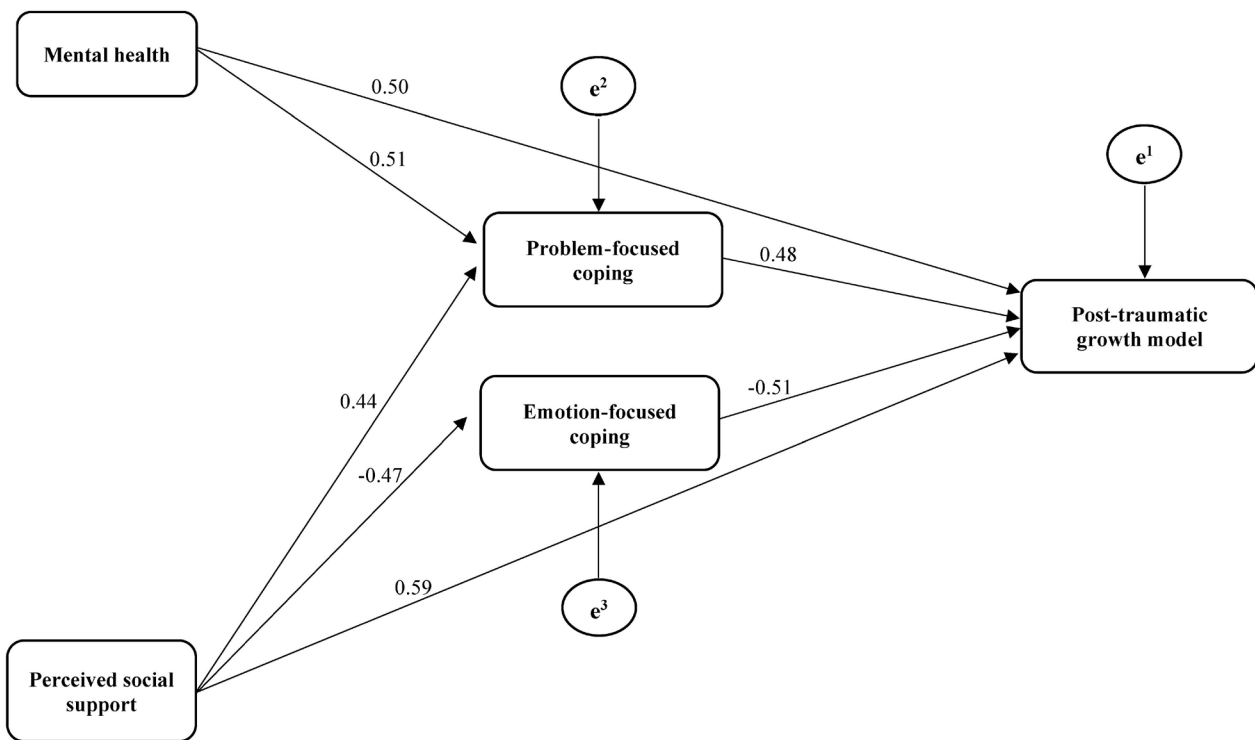

Figure 1. The initial model of the mediating role of coping strategies in the relationship of mental health and perceived social support with the Post-traumatic Growth Model. *Note.* Reference: Results of the present study.

recovered patients (Table 3).

The bootstrapping method was used to evaluate the significance of intermediary relationships. Table 4 summarizes these findings. The results showed that there was a significant indirect path from mental health to post-traumatic growth model through the mediating role of problem-focused coping in the COVID-19 recovered patients (*P*=0.001). Moreover, there was a significant indirect path from perceived social support to the post-traumatic growth model through the mediating role of problem-focused coping and emotion-focused coping in the COVID-19 recovered patients (*P*=0.001). Nevertheless, there was not a significant indirect path from mental health to post-traumatic growth model through the mediating role of emotion-focused coping as illustrated in Table 4.

Discussion

This study aimed to investigate the relationship of mental health and perceived social support with the

Figure 2. The modified final model of the mediating role of coping strategies in the relationship of mental health and perceived social support with the Post-traumatic Growth Model. *Note.* Reference: Results of the present study.

Table 3. Direct effects between research variables in the initial and final modified models

Path	Initial model		Final modified model	
	β	*P*	β	*P*
Mental health to problem-focused coping	0.57	0.003	0.51	0.001
Mental health to emotion-focused coping	-0.19	0.214	-	-
Mental health to post-traumatic growth model	0.54	0.001	0.50	0.003
Perceived social support to problem-focused coping	0.48	0.011	0.44	0.002
Perceived social support to emotion-focused coping	-0.52	0.021	-0.47	0.011
Perceived social support to post-traumatic growth model	0.62	0.001	0.59	0.001
Problem-focused coping to post-traumatic growth model	0.59	0.001	0.48	0.001
Emotion-focused coping to post-traumatic growth model	-0.57	0.001	-0.51	0.006

Table 4. Results of analysis of indirect and intermediary paths in the final modified models

Predictor variable	Mediator Variable	Criterion variable	Initial model		Final modified model	
			β	*P*	β	*P*
Mental health	Problem-focused coping	Post-traumatic growth model	0.129	0.017	0.133	0.001
Perceived social support	Problem-focused coping	Post-traumatic growth model	0.126	0.020	0.139	0.001
Mental health	Emotion-focused coping	Post-traumatic growth model	0.113	0.121	0.125	0.216
Perceived social support	Emotion-focused coping	Post-traumatic growth model	0.131	0.025	0.149	0.001

post-traumatic growth model through the mediating role of coping strategies in COVID-19 recovered patients in Golestan province in 2021. The results revealed that there was a positive relationship between mental health and problem-focused coping as well as between mental health and the post-traumatic growth model. Further, there was a positive relationship between perceived social support and problem-focused coping as well as between perceived social support and the post-traumatic growth model. Moreover, there was a direct relationship between problem-focused coping and post-traumatic growth. According to the results of the present study, there was a negative relationship between perceived social support and emotion-focused coping and between emotion-focused coping and post-traumatic growth model in the COVID-19 recovered patients. The results indicated that problem-focused coping had a mediating role in the relationship of mental health and perceived social support with the post-traumatic growth model. Further, emotion-focused coping had a mediating role in the relationship between perceived social support and the post-traumatic growth model.

The results indicated that there was a positive and significant relationship between mental health and problem-focused coping in the COVID-19 recovered patients. Consistent with these results, Ding et al (36) found a relationship between mental health and coping styles in the students during COVID-19 pandemic. To explain these results, it may be said that if COVID-19 recovered patients find their stress manageable, they will employ a more problem-focused coping style, but if they find stress unmanageable, they will be likely to use an emotion-focused coping style. This pattern explains why problem-focused coping strategies are often used when work-related, interaction-related, and social functioning-related stressors arise (19). It also explains why people utilize more emotion-focused coping strategies when dealing with health-related stress or mood changes (e.g., anxiety and depression). Using an emotion-focused strategy stops people from dealing with the situation directly and effectively, reducing their capacity to tackle the problem. This condition reduces mental integrity, causes emotional turbulence, and declines mental health. Mental and emotional turmoil also makes it more difficult to identify the cause of stress and negatively influences psychological health (20). There might be several reasons why the association between mental health and emotional coping strategies does not seem to be significant. As an example, if this study were done at a different time or location, the relationship between mental health and emotion-focused coping strategies would most certainly be significant. Furthermore, the components of mental health that influence emotional coping strategies may not be identical or may stem from two distinct philosophical and cultural origins (18).

According to the findings, there was a positive and significant relationship between mental health and post-traumatic growth model in the COVID-19 recovered patients. Consistent with these results, Slade et al (15) demonstrated that post-traumatic growth is often part of mental health recovery. To further explain, a person's mental health is affected by his view of the circumstances, belief systems, values, and socio-cultural context, so anything that might increase this mental perception would eventually improve a person's mental health. The COVID-19 does not induce hopelessness and helplessness in patients experiencing post-traumatic growth (7). Instead, it serves as a pivotal point in their life, allowing them to view themselves in the face of new challenges and experiences. As a result, these patients' perspectives on life can improve, accordingly enhancing their psychological health.

Moreover, the results indicated that there was a positive and significant relationship between perceived social support and post-traumatic growth model in the COVID-19 recovered patients. Consistent with these results, Sörensen et al (37) found a relationship between perceived social support and post-traumatic growth. Arguing with a patient is expected in families with a COVID-19 sufferer. Recovered patients who have adequate social support and can use problem-solving skills instead of avoidance strategies may use this behavioral style outside the family to help their recovery. A lack of social support is one of the predictors of COVID-19 patients' readmission to the hospital and an increase in casualties. In contrast, perceived social support may predict support when required. This support is often forward-thinking and might mentally contribute to coping with life's challenges or difficulties (20). A person who enjoys such support is aware that other can help him when he is in need and hopeless. As a result, it is more adaptable to life's difficulties. To interpret these results, it may be said that patients who employ problem-focused coping strategies have greater control over stressful circumstances, which stops them from feeling weak and incompetent in such situations and allows them to cope with their stress actively. This is a factor that contributes to the growth after traumatic stressors like COVID-19 (20). Furthermore, patients who utilize the emotional coping style have more difficulty in stressful circumstances; accordingly, they have a lower chance of recovering from an injury.

There were several limitations to this study: First, it was only conducted on recovered COVID-19 patients in Golestan province; therefore, generalizing the findings to other statistical populations should be done with caution. Second, the study results were based on scales or questionnaires, which are prone to distortion due to conclusions based on unconscious responses.

Conclusion
Following the results, the proposed model achieved a desirable good fit. The findings may be utilized to improve mental and physical patterns among COVID-19 patients.

Given the significance of the post-traumatic growth pattern in COVID-19 patients, this study may lead to future research. In this sense, it may help investigations on stress-related difficulties and behavioral disorders (e.g., anxiety and depression). The findings of this study may also pave the way for psychological interventions. It is also recommended that plans be established to enhance the post-traumatic growth rate associated with the pandemic.

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