



## Research Paper

# The Relationship of Mental Health and Resilience with Posttraumatic Growth through the Mediating of Defensive Styles in the COVID-19 Survivors



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## ABSTRACT

**Background:** During the COVID-19 pandemic, the number of people suffering from psychological disorders has increased all over the world.

**Objectives:** The present study aimed to investigate the relationship of mental health and resilience with Posttraumatic Growth (PTG) through mediating of defensive styles in the COVID-19 survivors.

**Materials & Methods:** This was a descriptive cross-sectional study using Structural Equation Modeling (SEM). The research population included all COVID-19 recovered patients in Gorgan, Iran. Using convenience sampling method, 300 patients who recovered from COVID-19 were selected. The research instruments included the Posttraumatic Growth Inventory, Connor-Davidson Resilience Scale, the General Health Questionnaire, and Defense Style Questionnaire. The participants were given questionnaires online.

**Results:** The results of SEM suggested that the proposed model fits the data. The direct paths from PTG, mental health, and resilience to the developed defensive styles were positive and significant ( $P < 0.01$ ). In addition, the relationship between mental health and resilience with PTG was positive and significant ( $P < 0.01$ ). The relationship between PTG, mental health, and resilience with the immature and neurotic defensive styles was negative and significant ( $P < 0.01$ ).

**Conclusion:** The findings revealed that mental health, resilience, and developed defensive styles had a tremendous impact on the increase of PTG in COVID-19 patients. Accordingly, they can be used to reduce the psychological problems caused by the COVID-19 pandemic.

**Keywords:** Posttraumatic growth, Mental health, Resilience, Defensive styles, COVID-19

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## 1. Introduction

The pandemic state of COVID-19 has affected almost every crucial economic and social aspect of life around the world, thus, the psychological effects of this viral disease on mental health of individuals in different social aspects are enormously crucial [1, 2]. The stress caused by COVID-19 and its destructive psychosocial effects have overshadowed the health, mental well-being and adjustment of human being in all age groups [3]. Quarantine and basic hygiene practices are used as a way to prevent the transmission and spread of disease. Tolerating long-term quarantine is an unpleasant and stressful experience for different people and changes their lives [4, 5]. Previous research in China showed a high prevalence of anxiety and depression symptoms among the members of the families of hospital personnel due to the COVID-19 pandemic [6].

One of the crucial aspects taken into account after recovery from COVID-19 is patients' mental health after the disease [7]. Mental health is how a person feels about themselves, the world around them, where they live and those around them. Mental health encompasses emotional and psychological health, in a way that a person can use her thinking, abilities, and functions in society and meet the normal needs of daily life [8]. On account of the outcomes of COVID-19 including the behavioral and psychological problems in the cognitive and emotional fields, the researchers sought to identify the crucial variables to reduce these outcomes [9, 10]. Another research in China demonstrated that the COVID-19 pandemic caused a great impact on the public mental health status [11]. The active coping strategies, as well as increasing social support, are considerably effective in reducing psychological distress.

Posttraumatic Growth (PTG) is defined as positive personal and psychological changes after a trauma, which occurs after being involved in a horrific accident, and it is caused when the individual fights against this stressful accident [12]. Some people develop PTG after experiencing chronic diseases [13]. Thus, disparate psychological factors can lead to its development.

Defensive styles are among the important variables in dealing with stressful unknown situations. Defensive styles are the automatic regulating processes that reduce cognitive dissonance and minimize the sudden changes in the internal and external reality by causing an influence on the way an individual perceives threatening accidents [14, 15]. Andrews et al. [16] divided the defense

mechanisms into three groups, i.e., developed, neurotic, and immature. The developed defensive style is an adaptive, normal, and efficient coping strategy. The immature and neurotic defensive styles include maladaptive and inefficient coping strategies [17, 18].

One of the indices influencing the improvement of psychological characteristics is the extent of resilience [19, 20]. Resilience is one of the protective factors that play a vital role in individuals' success and survival during harsh situations. Accordingly, this characteristic enables individuals to develop adaptive behaviors, easier to deal with problems, and effectively deal with obstacles they face in the path to success [21, 22]. Finstad et al. [23] demonstrated that there is a positive relationship between resilience and PTG.

Considering the ever-increasing spread of COVID-19 throughout the world and the considerable physical, psychological, and social pressures exerted on the patients who recovered from the disease, it is essential to conduct studies in this regard. Besides, investigating the defensive styles of patients who recovered from the disease can reduce the pressure exerted on the survivors and improve their mental health and resilience. Therefore, the present study aimed to investigate the relationship of mental health and resilience with posttraumatic growth through the mediating of defensive styles in the COVID-19 survivors in Golestan Province.

## 2. Materials and Methods

### Study type and study population

The descriptive cross-sectional study was performed on COVID-19 recovered patients in Gorgan, Iran from August to December 2021. The participants had served a 14-day quarantine period. Among the health centers of Gorgan, two centers were randomly selected and contact information of recovered COVID-19 patient was received. Using the convenience sampling method, 300 patients recovered from COVID-19 were selected. Online research questionnaires were designed, uploaded to a credible website (Porsline), and the link of the questionnaires was provided to the participants through a short mobile message. Inclusion criteria were as follows: recovered COVID-19 patient (passing the 14-day quarantine period); conscious agreement to participate in the research; age range of 20 to 60 years; no mental problems and no use of psychiatric medications based on the participants' self-declaration. The exclusion criterion included failing to respond to questions. online informed consent was taken from participants.

Three questionnaires including Posttraumatic Growth Inventory (PTGI), Connor-Davidson Resilience Scale (CD-RISC), General Health Questionnaire (GHQ-28), and Defense Style Questionnaire (DSQ) were used in this study. PTGI was developed by Tedeschi and Calhoun in 1996 to examine the beneficial results experienced by individuals with a history of trauma. PTGI consists of 21 items in 5 domains: relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. The questionnaire is scored 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 [24] found an internal consistency of 0.90 for this questionnaire. Heidarzadeh et al. [25] reported the reliability of this questionnaire equal to 0.81 based on Cronbach's alpha coefficient. In this study, Cronbach's alpha coefficient was 0.84 for the questionnaire.

CD-RISC consisted of 25 items, which measure resilience on the basis of the 5-point Likert scale, ranging from zero (totally disagree) to 4 (totally agree). CD-RISC is comprised of five subscales: personal competence and tenacity, trust in one's instincts and strengthening the effect of stress, positive acceptance of change and secure relationships, self-control, and spiritual influences [26]. The reliability of the Connor-Davidson Resilience Scale was estimated to be 0.89 [27], and the Cronbach's alpha coefficient was determined to be 0.85 for the scale in the present study.

Goldberg and Hiller designed the GHQ-28 in 1979 [28]. This questionnaire has 28 items. Participants rate each item on a four-point Likert scale from strongly disagree to strongly agree. The questions are rated on a scale of 1 to 4, which higher scores indicate better person's mental health. The reliability of the GHQ was estimated to be 0.91 [29], and the Cronbach's alpha coefficient was determined to be 0.87 for the questionnaire in the present study.

DSQ was developed by Andrews et al. [16] and comprises 40 questions, in which 20 defense mechanisms are evaluated in three subscales, i.e., developed, neurotic, and immature. It is scored on the basis of the Likert scale, ranging from 1 to 9 [16]. Jafari et al. [30] reported the reliability of this questionnaire equal to 0.79 based on Cronbach's alpha coefficient. In this study, Cronbach's alpha coefficient was 0.83 for the questionnaire.

### Statistical analyses

Data were described using mean, Standard Deviation (SD), frequency and percentage. The data was analyzed through structural equation modeling (SEM) using SPSS and AMOS software version 25. To evaluate the fitness of the model, the indices including Incremental Fit Index (IFI) (>0.90), Comparative Fit Index (CFI) (>0.90), Normed Fit Index (NFI) (>0.90), and Root Mean Square Error of Approximation (RMSEA) (<0.08) were used. The bootstrap method was used to estimate 95% confidence interval of the estimates. All statistical analyses were performed at the 0.05 level of significance.

### 3. Results

The study participants included 300 patients recovered from COVID-19. The mean age of the participants was 36.67 (SD=8.25) years old. In terms of age categories, 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. 49 % had a high school diploma, and 51 % had a university degree. The descriptive statistics, including mean, Standard Deviation (SD), and correlation between the study variables, are presented in Table 1. The results indicated that, there was a moderate and direct correlation between mental health and defensive styles ( $r=0.42$ ), PTG ( $r=0.39$ ), and resilience ( $r=0.43$ ). Moreover, there was an inverse correlation between PTG and defensive

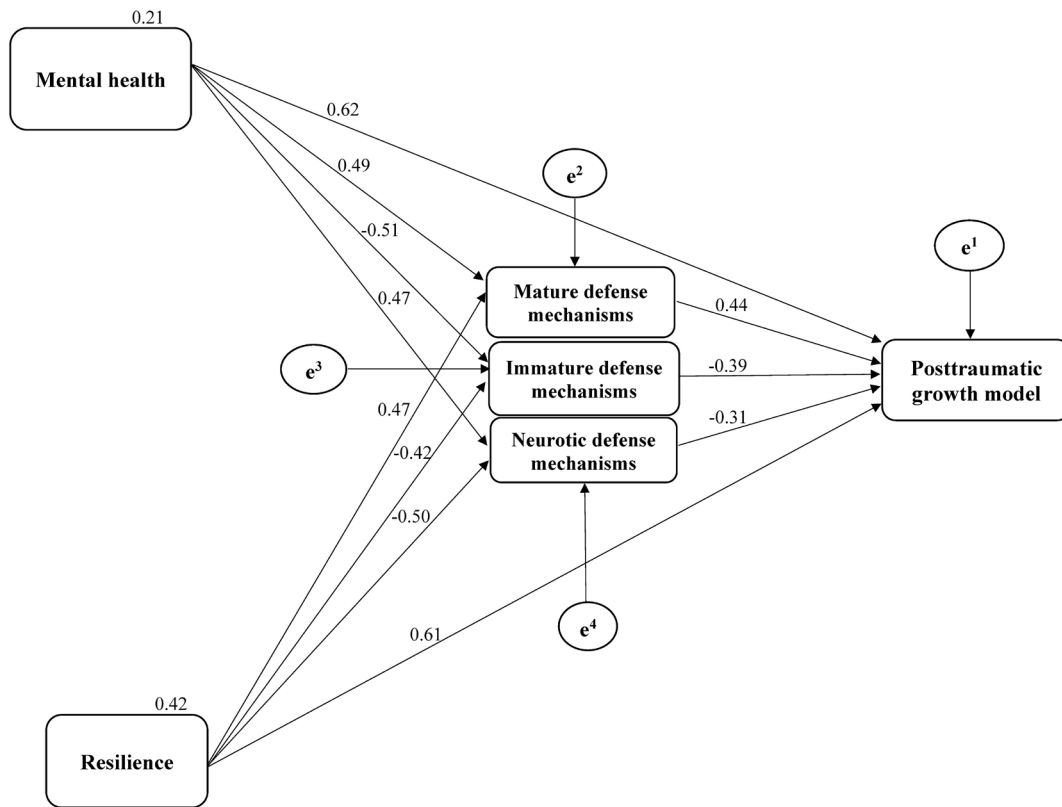
**Table 1.** Mean (SD), skewness, kurtosis, and Pearson correlation coefficients of the research variables

Variables	Mean±SD	Min.	Max.	Skewness	Kurtosis	1	2	3	4
Mental health	61.16±21.14	42	96	0.45	0.76	1			
Defensive styles	52.81±17.34	42	79	0.38	0.67	0.42**	1		
Posttraumatic growth model	44.65±12.33	39	87	0.23	0.73	0.39**	-0.46**	1	
Resilience	49.22±15.26	24	65	0.42	0.55	0.43**	0.21**	0.33**	1

\*\*P<0.01

**Table 2.** fit indicators of the proposed model

Fit Indicators	$\chi^2$	df	$(\chi^2/df)$	IFI	TLI	CFI	NFI	RMSEA
Proposed model	2.21	1	2.21	0.93	0.93	0.93	0.95	0.022



**Figure 1.** The proposed model of the mediating role of defensive styles in the relationship of mental health and resilience with the posttraumatic growth model

**Table 3.** Coefficients of indirect and mediation paths in the proposed model

Predictor variable	Mediator Variable	Criterion variable	Unstandardized Coefficients		Standardized Coefficients	Critical ratio	P
			B	SE	$\beta$		
Mental health	Mature defense mechanisms	Posttraumatic growth model	0.44	0.06	0.22	3.66	0.001
Resilience	Mature defense mechanisms	Posttraumatic growth model	0.39	0.07	0.21	3.09	0.004
Mental health	Immature defense mechanisms	Posttraumatic growth model	0.29	0.17	0.20	1.19	0.001
Resilience	Immature defense mechanisms	Posttraumatic growth model	0.26	0.03	0.16	4.82	0.001
Mental health	Neurotic defense mechanisms	Posttraumatic growth model	0.27	0.07	0.17	2.42	0.001
Resilience	Neurotic defense mechanisms	Posttraumatic growth model	0.23	0.03	0.16	5.35	0.001



styles ( $r=-0.46$ ) and mild association between PTG and resilience ( $r=0.33$ ).

The theoretical model of the mediating role of defensive styles in the relationship of mental health and resilience with PTG is presented in [Figure 1](#). The Model fitness indicators are presented in [Table 2](#). According to the RMSEA equal to 0.022, the goodness of fit of the proposed model was met.

The results showed there was a direct relationship between mental health and mature defense mechanisms ( $\beta= 0.49$ ;  $P= 0.001$ ), immature defense mechanisms ( $\beta= -0.51$ ;  $P= 0.012$ ), neurotic defense mechanisms ( $\beta= -0.56$ ;  $P= 0.001$ ), and posttraumatic growth model ( $\beta= 0.62$ ;  $P= 0.001$ ) in the COVID-19 survivors. There was a direct relationship between resilience and mature defense mechanisms ( $\beta= 0.47$ ;  $P= 0.001$ ), immature defense mechanisms ( $\beta= -0.42$ ;  $P= 0.003$ ), neurotic defense mechanisms ( $\beta= -0.50$ ;  $P= 0.004$ ), and posttraumatic growth model ( $\beta= 0.61$ ;  $P= 0.001$ ) in the COVID-19 survivors. Moreover, there was a positive relationship between mature defense mechanisms and posttraumatic growth model ( $\beta= 0.44$ ;  $P= 0.003$ ). There was a negative relationship between immature defense mechanisms and posttraumatic growth model ( $\beta= -0.39$ ;  $P= 0.011$ ), and between neurotic defense mechanisms and posttraumatic growth model ( $\beta= -0.31$ ;  $P= 0.022$ ) in the COVID-19 survivors ([Figure 1](#)).

[Table 3](#) shows indirect and mediation path of the model. The results showed there was a significant indirect path from mental health to posttraumatic growth through the mediating role of defensive styles in the COVID-19 survivors ( $P<0.001$ ). Moreover, there was a significant indirect path from resilience to posttraumatic growth model through the mediating role of defensive styles in the COVID-19 survivors ( $P<0.01$ ).

#### 4. Discussion

This study aimed to investigate the relationship of mental health and resilience with posttraumatic growth through the mediating role of defensive styles in the COVID-19 survivors in Golestan Province. The results showed that there was a direct relationship between mental health with mature defense mechanisms, immature defense mechanisms, neurotic defense mechanisms, and PTG in the COVID-19 survivors. Moreover, defensive styles had a mediating role in the relationship of mental health and resilience with the posttraumatic growth model in the COVID-19 survivors. The results confirmed the model's goodness of fit. This finding is

consistent with the research results of previous study [9, 17, 23].

The findings revealed that individuals suffering from low levels of mental health use more immature mechanisms than individuals with high levels of mental health. In general, the COVID-19 survivors tend less to use developed defense mechanisms, which can aggravate their physical state since the defense mechanisms lead to physical and psychological outcomes [15]. Therefore, when individuals use developed defensive mechanisms against bad situations, they experience less anxiety than individuals who use immature defensive mechanisms. Besides, they enjoy higher levels of general health.

Individuals' mental health is associated with their values and belief system in the cultural context of society. Thus, any factor that increases mental perception can eventually improve their mental health. When a patient experiences PTG, COVID-19 does not lead to the feeling of despair and hopelessness, yet it becomes a turning point in their lives and enables them to encounter new situations and experiences [7]. Hence, their mental perception of life situations improves, and as a result, it raises the mental health of the patient.

Resilience is one of the crucial factors in experiencing and managing comorbidities in COVID-19 survivors [21]. Accordingly, the patients who recovered from COVID-19 who have demonstrated resilience, participated more effectively in the course of treatment since they are more prepared to accept the natural periods of their disease. Patients with higher levels of PTG reported high resilience. When explaining this relationship, they expressed that stress is one of the important factors that prevent individuals from developing PTG. Besides, resilience protects an individual from stress and paves the ground for development and excellence during stressful situations [23]. Per the findings, patients who reported higher levels of PTG enjoyed higher resilience as well.

Resilience is the ability to moderate the level of controlling irritation via adaptive methods in COVID-19 survivors. Moreover, patients with higher levels of resilience do not demonstrate problematic behaviors. Resilience is a concept that is used for describing personality traits that facilitate and enable adjusting to stressful factors in life, moderating impulses, and adjusting to new situations. It appears that resilience has a strong relationship with the defensive mechanisms and the models defining the defense mechanism [22]. When COVID-19 survivors use immature and neurotic defensive styles, these styles might result in the reduction of resilience.

Consequently, it can aggravate their disease. In other words, when the patients use more immature and neurotic defensive mechanisms, their resilience decreases, and as a result, they experience more negative emotions and have fewer options to reduce their psychological distresses [15]. In general, there is a positive significant relationship between the developed defensive mechanisms and resilience. Therefore, it can be concluded that the immature and neurotic defensive mechanism increases anxiety, insomnia, and depression, and using the developed defensive mechanism reduces anxiety, insomnia, and depression. Consequently, it increases the resilience of patients.

The defensive mechanisms protect individuals from excessive internal and external anxiety. Even though this mental force is helpful in the short term, considering that patients are emotion-oriented and do not focus on resolving the problems, it can pose problems to the patients' long-term adjustment [17]. In fact, it can be argued that patients who enjoy a higher PTG, use more developed defensive styles than immature and neurotic styles.

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.

## 5. Conclusion

In this study, the proposed model achieved a desirable goodness of fit. The findings may be utilized to improve mental and physical patterns among COVID-19 patients. Given the significance of the posttraumatic 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), and its findings may pave the way for psychological interventions. It is also recommended that plans be established to enhance the posttraumatic growth rate associated with the pandemic.

## Ethical Considerations

### Compliance with ethical guidelines

The study was approved by the Ethical Committee of Islamic Azad University, Tonekabon Branch (Code: IR.IAU.TON.REC.1400.033).

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## Authors' contributions

Study concept and design, acquisition of data, analysis and interpretation of data, and statistical analysis: Elnaz Deldadeh Mehraban; Administrative, technical, and material support, study supervision: Abdolhassan Farhangi; Critical revision of the manuscript for important intellectual content: Shahnam Abolghasemi and Abdolhassan Farhangi.

## Conflict of interest

The authors declared no conflict of interest.

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