



Designing and Testing a Causal Model of Post-Traumatic Growth based on Personality Traits and Meaning in Life with the Mediating Role of Psychological Resilience in Veterans

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ABSTRACT

Aims This study aimed to provide a causal model of personality traits and meaning in life with post-traumatic growth, with a mediating role of psychological resilience in veterans.

Instrument & Methods The method of this research is descriptive-correlational. Data analysis is done through path analysis and structural equations. The statistical population of the study was all veterans under the support of the Sabzevar Martyr Foundation in 2021 and 320 subjects were selected as a sample. To collect data, the post-traumatic growth inventory, the brief HEXACO inventory, the meaning in life questionnaire, and the Connor-Davidson resilience scale were used. All data analyzes were performed by SPSS 24 and LISREL 8.8 software.

Findings The proposed model had a good fit (GFI: 0.86, CFI: 0.92). Also, personality traits and meaning in life, directly and indirectly, affected post-traumatic growth.

Conclusion This model can be a good model for identifying the factors involved in the post-traumatic growth of veterans and the results of this study can be used for planning to increase post-traumatic growth.

Keywords Post-Traumatic Growth; HEXACO Personality Traits; Life; Resilience

CITATION LINKS

[1] Relationship of early maladaptive schemas ... [2] Secondary traumatization in first responders ... [3] Evaluation of post-traumatic stress disorder ... [4] Clinical implications of the proposed ... [5] Personality factors and their impact on PTSD ... [6] Satisfaction with life, big-five personality traits ... [7] Does growth require suffering? A systematic review ... [8] A six-factor structure of personality-descriptive adjectives ... [9] Posttraumatic growth ... [10] Personality, posttraumatic stress ... [11] Posttraumatic growth, personality ... [12] Posttraumatic growth profiles and ... [13] Post-traumatic growth as positive personality change ... [14] Modeling resilience, meaning in life ... [15] Meaning in life: resilience beyond ... [16] Direct and indirect links between religious coping ... [17] Meaning in life buffers the association ... [18] Building your ... [19] Adolescent perceptions of resilience promoting ... [20] Refining grit in academic performance: the meditational ... [21] Meaning, social support, and resilience as predictors ... [22] The posttraumatic growth inventory: measuring ... [23] Validation of the Persian version of the ... [24] The 24-item brief HEXACO ... [25] Psychometric properties of Persian version ... [26] The meaning in life questionnaire ... [27] The role of locus of control, meaning of life ... [28] Development of a new resilience ... [29] Relationships among hope, meaning in ... [30] Meaning in the context of stress and ... [31] The role of positive emotions in positive ... [32] Relationship of social support, coping strategies ... [33] The mediating effect of cognitive emotion ... [34] A longitudinal examination of the association ... [35] A decade of meaning: past ... [36] The relationship between meaning in ... [37] The resilience handbook: approaches The resilience handbook: approaches ...

Introduction

One of the devastating consequences of any war is the mental and physical problems of those who are directly or indirectly involved in it. These problems can become apparent and show their consequences as time goes by a study [1]. Since veterans experience increasing levels of trauma following participation in the war, so they are at higher risk for developing post-traumatic stress disorder (PTSD) [2]. In Iran, 51% of veterans experience PTSD [3]. According to the 11th International Classification of Diseases, PTSD is one of the psychiatric conditions that is mainly associated with war trauma and it is specifically characterized by symptoms such as re-experiencing the traumatic event, avoiding trauma reminders, and Hyperarousal [4]. For some people, coping with PTSD can lead to positive changes in various areas of life [5]; The term "post-traumatic growth" refers to a set of positive changes in relationships with others, self-perception and existential beliefs, in the form of a greater appreciation of life and openness to spirituality, which can result from trying to deal with a traumatic event or refers to a very stressful experience life [6]. A recent meta-analysis has shown that the development of social relationships, self-esteem, and environmental mastery occurs as a result of negative life events [7].

On the other hand, to achieve a complete perception of the relationship between PTG and well-being: additional moderating variables, especially personality traits, should be reviewed [6]. The set of six personality factors (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience) is called the HEXACO structure [8]. Since cognitive processing is essential for PTG [9], it can be expected that people who show openness are more likely to be ready for cognitive processing of the traumatic event and its meaning, and therefore they show greater growth [10]. Neuroticism reflects vulnerability to negative emotions; it is not surprising that it is a negative predictor of post-traumatic growth; Conversely, personality traits such as extroversion and agreeability represent a good predictor of PTG [5]. In this regard, Panjikidze *et al.* [11] showed that the main predictors of post-traumatic growth were extraversion, conscientiousness, and social support. Also, Rzeszutek *et al.* [6] showed that extraversion and life satisfaction had the most important correlation with post-traumatic growth. In a study, Taku & Mclarnon [12] examined Hexaco personality traits with five areas of post-traumatic growth and found relationships between them. Some theories of PTG claim that PTG reflects sustained changes in meaning and purpose [13]; In other words; the experience of meaning in life is associated with the experience of post-traumatic growth [14]. Meaning helps traumatized people to evaluate traumatic

events positively, and also achieve the psychological resources needed to rediscover themselves, retrieve their basic hypothetical world, and orient themselves toward future goals [15]. In a study that was performed by Abu-Raiya & Sulleiman [16], a significant relationship was found between meaning in life and post-traumatic growth. In addition, this finding is consistent Marco & Alonso [17] who reported that encouraging patients with mental disorders to find meaning in life can be an effective strategy for dealing positively with negative events. It seems one of the variables that can mediate the relationship between personality traits and meaning in life with post-traumatic growth is psychological resilience. The American Psychological Association [18] defined resilience as the process of adapting to problems, traumas, disasters, threats, or even significant sources of stress. van Rensburg *et al.* [19] stated that resilience is a phenomenon in which one can adapt and grow in unfavorable conditions; it is a set of dynamic and countless interactions that contribute to positive results. Resilience is not just passive resistance to traumas with threatening conditions. Rather, the resilient person is an active participant and creator of his/her environment [20]. Also, Boullion *et al.* [21] showed that meaning, social support and resilience play a role in predicting post-traumatic growth. Weber *et al.* [14] proposed a model which supported the theory that resilience and post-traumatic growth are two distinct structures. In summary, veterans with moderate levels of PTSD symptoms reported higher PTG levels; These results suggest that focusing on PTG in the treatment of PTSD may lead to better overall performance and more positive outcomes for people with moderate PTSD [5]; By summarizing the research results, this study intends to investigate the proposed model, which is taken from research and studies conducted in this field. Based on existing research, a model that incorporates all of these variables has not yet been examined. Therefore, this study aimed to provide a causal model of personality traits and meaning in life with post-traumatic growth, with a mediating role of psychological resilience in veterans.

Instrument and Methods

This descriptive-survey research is correlational, and also in terms of purpose is an applied type. The statistical population of the study consisted of all veterans under the support of the Sabzevar Martyr Foundation (N=3156) in 2021. According to the number of variables in the present study, the sample size of 200 subjects was sufficient, but to increase the validity of the research, 320 subjects were considered. After determining the sample size by convenient sampling method and considering the inclusion and exclusion criteria, the samples were selected. Inclusion criteria include veterans with at least 25% injuries, ability to answer questionnaires,

literacy, and willingness to participate in research. Exclusion criteria include: having psychotic disorders, suffering from deadly physical diseases such as cancer, and experiencing a severe accident in the last 6 months. Common codes of ethics in medical research include 13, 14, and 2 (benefits from the findings for the progress of human knowledge), code 20 (coordination of research with religious and cultural standards) and codes 1, 3, and 24 (satisfaction of subjects and his/her legal representatives) has been observed in the present study.

Post-Traumatic Growth Inventory (PTGI)

This scale consists of 21 items and 5 factors [22]. The responses have positive words and use a 6-point Likert scale. The reported alpha coefficient for the total score is 0.90. Heidarzadeh *et al.* [23] reported an alpha coefficient of 0.87 for the whole tools and the obtained coefficients for the components of the scale between 0.55 to 0.77, and also its validity was reported as desirable. In the present study, its reliability was obtained at 0.89 using Cronbach's alpha analysis.

The Brief Hexaco Inventory (BHI)

de Vries [24] introduced The Brief Hexaco Inventory, which has 24 items. This questionnaire consists of 6 dimensions, each of which has 4 questions. This questionnaire is based on the 5-point Likert scale. In a previous study, the reliability and validity of subscales have been reported above 80% [24]. Test-retest reliability and acceptable parallel correlation coefficient between subscales with long HEXACO forms have been reported. The reliability coefficient of the scales is reported to be between 0.53 and 0.69 [24]. Basharpour *et al.* [25] reported that Cronbach's alpha coefficient of subscales was obtained between 0.63 and 0.88. In the present study, the reliability of honesty-humility, emotionality, extroversion, agreeableness, conscientiousness, and openness to experience was 0.68, 0.82, 0.81, 0.79, 0.82, 0.75 respectively, using Cronbach's alpha analysis.

Meaning in Life Questionnaire (MLQ)

This questionnaire Designed by Steger *et al.* [26] consists of 10 items and includes the two dimensions of the presence of meaning and the search for meaning in life. Participants score on a scale of 1 to 7. Cronbach's alpha for the presence of meaning in life and the search for meaning in life was relatively high, from 0.86 to 0.88. Test-retest coefficients of stability (0.70 and 0.73) were good and showed good internal consistency (0.88 and 0.93) for the presence of meaning in life and the search for meaning in life, respectively. In Moatamedy *et al.* [27], Cronbach's alpha coefficient for the search for meaning subscale was 0.85 and for the presence of meaning was 0.80. In the present study, its reliability was obtained using Cronbach's alpha analysis equal to 0.87.

The Connor-Davidson Resilience Scale (CD-RISC)

This questionnaire was presented by Connor & Davidson [28]. This questionnaire has 25 items that subjects determine their answer on a 5-point scale. The total score in this test is from 0 to 100, on this scale, higher scores indicate more resilience in the individual. Internal consistency of the resilience scale was obtained at 0.89 using Cronbach's alpha and test-retest reliability of 0.87 [28]. In the present study, its reliability was obtained at 0.79 using Cronbach's alpha analysis.

After obtaining the code of ethics from Mohaghegh Ardabili University, the researcher referred to the Martyr Foundation of Sabzevar and with the necessary arrangements made, the questionnaires were distributed among the veterans. Since the convenient sampling method was applied in this study, and the online questionnaire link was broadcast for 4 weeks, the link remained active and during this period, 320 questionnaires were provided to researchers by eliminating incomplete cases. Necessary explanations such as the purpose of the research and how to answer the questions were provided in the questionnaire and individuals participated in this research completely voluntarily. Structural equations were used by path analysis method and were analyzed using SPSS 23 and Lisrel 8.8 software.

Findings

A total of 320 veterans with a mean age of 58.82 ± 4.70 in the age range of 50 to 71 years participated in this study. Most of the veterans, aged 55 to 60, were single, had associate degrees, and were self-employed. Descriptive indicators of post-traumatic growth, personality traits, meaning in life, and psychological resilience variables are reported in Table 1. Due to the skewness values of the research variables that are between the range (2, -2), the research variables are normal in terms of skewness and their distribution is symmetric. Also, the amount of kurtosis of the research variables is in the range (2, -2). This indicates that the distribution of research variables has a normal kurtosis.

According to Table 2, the correlation matrix results, there was a negative and significant relationship between post-traumatic growth and emotionality, also there was a positive and significant relationship between honesty and humility, extraversion, agreeableness, conscientiousness, openness to experience, meaning in life, and psychological resilience ($p < 0.05$).

In the continuation of the research, method, the direct and indirect effects of cognitive characteristics and meaning in life through the mediation of psychological resilience on the post-traumatic growth of veterans are investigated using structural equations and path analysis (Figure 1).

Table 1) Descriptive statistics of research variables

Variables		Mean±SD	Skewness	Kurtosis
Post-traumatic growth	New possibilities	14.816±3.339	-0.650	-0.385
	Relating to others	20.334±4.823	-0.431	-0.890
	Personal strength	11.512±2.992	-0.446	-0.725
	Appreciation of life	8.841±2.007	-0.295	-0.535
	Spiritual change	8.718±1.684	-0.361	-0.912
	Total score	61.284±14.109	-0.525	-0.861
Personality traits	Honesty-Humility	11.141±3.177	-0.072	-1.147
	Emotionality	14.213±3.718	-0.553	-1.101
	Extroversion	10.262±3.142	-0.033	-0.620
	Agreeableness	12.247±3.495	-0.355	-0.921
	Conscientiousness	12.287±3.650	-0.431	-1.158
	Openness to Experience	12.788±3.504	-0.558	-0.853
Meaning in life	Presence of Meaning in Life	14.181±4.254	-0.371	-1.352
	search for meaning	14.884±3.180	-0.743	-0.173
	Total score	29.100±6.598	-0.455	-0.862
psychological resilience		59.744±19.599	-0.321	-1.273

Table 2) Correlation matrix of research variables (p<0.01 in all cases)

Variables	9	8	7	6	5	4	3	2	1
1. Posttraumatic growth	0.627	0.581	0.649	0.562	0.601	0.572	-0.614	0.501	1
2. Honesty-Humility	0.468	0.521	0.630	0.681	0.674	0.426	-0.620	1	
3. Emotionality	-0.408	-0.617	-0.621	-0.667	-0.722	-0.498	1		
4. Extroversion	0.589	0.502	0.540	0.483	0.467	1			
5. Agreeableness	0.485	0.565	0.648	0.694	1				
6. Conscientiousness	0.465	0.524	0.698	1					
7. Openness to Experience	0.595	0.564	1						
8. Meaning in Life	0.611	1							
9. Psychological resilience	1								

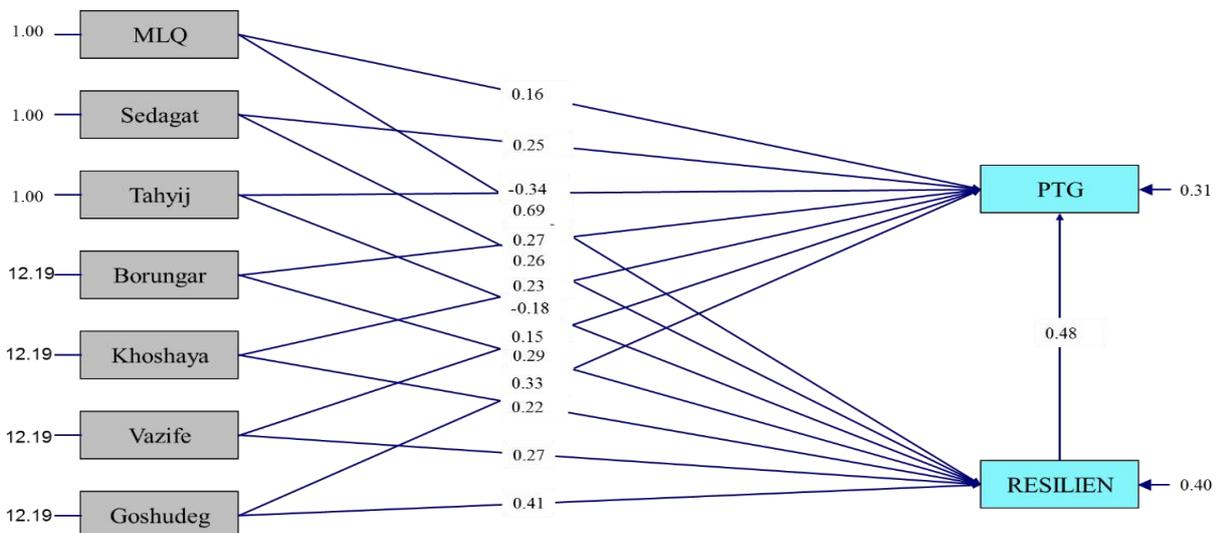


Figure 1) Research model test (in standard mode)

Based on the fit indices of the research model, the Chi-square ratio to the degree of freedom (X^2/df) equal, root mean square error of approximation (RMSEA), correlation of fit index (CFI), normalized fit index (NFI), and goodness of fit index (GFI) were 2.85, 0.074, 0.92, 0.91, and 0.86 respectively. According to the obtained results, it can be said that the research model is approved in terms of significance and fit indicators.

According to the path analysis model, the direct effect of the meaning in life ($\beta=0.16$), honesty and humility ($\beta=0.25$), extroversion ($\beta=0.27$),

agreeableness ($\beta=0.23$), conscientiousness ($\beta=0.15$) and openness to experience variables ($\beta=0.33$) on the post-traumatic growth of veterans are significant and positive, and the emotionality variable ($\beta=0.34$) is significant and negative on the post-traumatic growth of veterans ($p<0.01$); Also the variables of meaning in life ($\beta=0.69$), honesty and humility ($\beta=0.26$), extroversion ($\beta=0.29$), agreeableness ($\beta=0.22$), conscientiousness ($\beta=0.27$) and openness to experience ($\beta=0.41$) have a significant and positive effect on the psychological resilience of veterans, and the emotionality variable ($\beta=0.18$) has

a significant and negative effect on the psychological resilience of veterans. Thus, the direct effect of the psychological resilience variable ($\beta=0.48$) on veterans' post-traumatic growth is positive and significant. To investigate the indirect effect of personality traits and meaning in life on post-traumatic growth mediated by psychological resilience, the Sobel test was applied. Statistics called VAFs are also used to determine the severity of an indirect effect through a mediator, and the closer this value is to 1, the stronger the mediation effect is. This value measures the indirect effect to the total effect. Based on the results of the Sobel test, the variables of the meaning in life and personality traits, in addition to the direct effect, indirectly and through psychological resilience also affect post-traumatic growth. According to the obtained value for VAF statistics, it was observed that 67% of the effect of the meaning in life, 33% of the effect of honesty and humility, 20% of the effect of emotionality, 34% of the effect of extroversion, 31% of the effect of agreeableness, 46% of the effect of conscientiousness, and 37% of the effect of openness to experience on post-traumatic growth can be explained through psychological resilience.

Discussion

This study aimed to design and test the causal model of the relationship between personality traits and meaning in life with post-traumatic growth by the mediating role of psychological resilience in veterans. The obtained indices show that the assumed model has an acceptable fit. Findings showed that personality traits have a direct effect on post-traumatic growth. Many studies have examined the relationship between the five major personality traits and post-traumatic growth [5, 6, 10]. According to the descriptive action model, post-traumatic growth of pre-traumatic personality traits can affect PTG. therefore, it can be said that this factor has the domains of fear, anxiety, and dependence. These domains help people with high arousal avoid coping with a traumatic event, which may hinder the processing of events that are necessary for growth. Extroverts use coping strategies such as more support, problem-solving and cognitive reconstruction in the face of a traumatic event. Extraversion, therefore, helps people to cope with the traumatic consequences of an event by using more practical coping strategies [10]. Agreeableness has also been shown to be associated with higher levels of perceived and received social support. Thus, it seems that this feature facilitates PTG by accepting the individual from the traumatic event and seeking social support to deal with its consequences [10]. Since cognitive processing is essential for PTG [9], it can be expected that people who show openness are more likely to be ready for cognitive processing of the traumatic event and its meaning and therefore show greater growth [9].

The results showed that meaning in life has a direct effect on post-traumatic growth. This finding was consistent with [14, 16, 17]. Weber *et al.* [14] stated that people who understand the meaning of their lives are more likely to show that they have grown out of a traumatic event. Wang *et al.* [29] also concluded that meaning in life promotes PTG and the completion of relationships with others, the realization of new possibilities, the increase of personal strengths, the attainment of positive spiritual change, and the appreciation of life. This can be stated according to Park & Folkman's [30] theory of constructivism meaning. After experiencing a traumatic event, the semantic system of individuals is disrupted in safety time. To better adapt to the situation, one needs to create a new semantic system for oneself, and one of the components of meaning in life is the search for meaning. As a result, this component of meaning can help a person to better adapt to the situation.

Personality traits have an indirect effect on post-traumatic growth through psychological resilience. In other words, personality traits can indirectly affect post-traumatic growth by affecting resilience. Personality traits such as honesty, humility, extraversion, agreeableness, conscientiousness, and openness to experience affect post-traumatic growth by increasing resilience. These traits increase positive emotions. According to expansion and constructivism theory, positive emotional experiences may expand the set of immediate intellectual activities of individuals and create lasting personal resources such as physical, intellectual, and social resources to manage future threats [31]. Thus, a resilient person may have a broader mindset and resilient cognitive process, which can be useful for improving emotional stability and attenuating negative emotions, and ultimately lead to increased post-traumatic growth. It is thought that resistant people successfully adapt to problems and maintain their mental health [28]. On the other hand, people with extroverted and agreeable traits have good social relations with others, which leads to good social support for these people. Previous research has also found a positive relationship between social support and resilience and post-traumatic growth [32, 33].

Meaning in life indirectly affects post-traumatic growth through psychological resilience. Meaning in life helps people to deal with stressors and reach a new level of resilience [34]. Meaning in life is a balanced understanding of the good life and the dynamic interaction between positive and negative factors [35]. Humans will be able to develop their abilities by understanding the meaning of his/her life. A person's perception of the situation and his/her position in the world and trying to find meaning in life are ways to cope with stress and adapt to life challenges [36]. On the other hand, it has been made clear that resilience is based on social relations, both in the individual sense and in the

social sense, after the trauma, while individuals are resilient, they are more open to social interactions [37]. Therefore, resilience increases social support, which is one of the factors affecting post-traumatic growth. According to the above, meaning in life with the effect on resilience can have an indirect impact on post-traumatic growth.

Conclusion

In general, the results of this study showed that the initial model of the research is approved and has a good fit. Therefore, according to the results and explanations provided, generally, it can be said that personality traits, meaning in life, and psychological resilience have an important role in predicting post-traumatic growth in veterans. Using a sample group of veterans makes it difficult to generalize the results to other groups; Use only questionnaires to collect data; Sampling was done via a convenient sampling method which makes generalization difficult; Lack of controlling the role of disturbing variables such as the type of injury, the number of years of injury, age of people, etc. were also the limitations of the present study. Most research on PTG has used cross-sectional designs that are cost-effective and feasible, but potentially reflect post-change reconstruction rather than actual change; therefore, it is recommended to conduct longitudinal studies in this field. This model can be used to increase post-traumatic growth. This can be done by setting up programs and workshops to increase the awareness of veterans and the military and guide them to personality traits, meaning in life, and psychological resilience that affects post-traumatic growth.

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Ethical Permissions: Before conducting the research, the necessary coordination was made with the officials of the Martyr Foundation of Sabzevar city. Also, after the initial evaluations and writing the proposal, the mentioned plan was approved by the Research Commission of Mohaghegh Ardebili University with the ethics code IR.UMA.REC.1400.001. In addition, before conducting the research, the subjects were satisfied and ensured that the collected information would be confidential.

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