



Original Article

## Predicting post-traumatic growth based on resiliency, locus of control, and social health in cancer patients

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### Abstract

**Introduction:** In this study, the role of resilience, locus of control, and social health in predicting post-traumatic growth in cancer patients was investigated.

**Materials and Methods:** In this correlation-regression study in Mashhad-Iran, 212 patients (143 women and 69 men) with diagnosed cancer were selected using the convenient sampling method. Post-traumatic growth, resilience, locus of control, and social health questionnaires were used online. Data were analyzed using Pearson correlation and multiple regression methods in SPSS version 26 software.

**Results:** The results showed that there is a significant relationship between resilience, locus of control, and social health with post-traumatic growth ( $P < 0.05$ ). Also the results showed that resilience and social health are predictors of post-traumatic growth ( $P < 0.05$ ). However, the locus of control cannot predict post-traumatic growth in cancer patients ( $P > 0.05$ ).

**Conclusion:** Based on the findings, if resilience and social health are more, it can predict post-traumatic growth in cancer patients.

**Keywords:** Cancer, Locus of control, Post-traumatic growth, Resiliency, Social health

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### Introduction

Cancer is characterized by uncontrolled growth and expansion of abnormal cells. Cancer incidence has been increasing during the last few decades; globally, it is about one-sixth of deaths (1). Cancer is the third leading cause of death in Iran, and about 40,000 people die of cancer in Iran every year. It is estimated that this amount will increase (2).

Although continuous advances in treatment have increased the number of survivors, many patients experience symptoms of psychological distress following the diagnosis and treatment

process; sometimes, the cancer experience causes behavior avoidance, intrusive thoughts, negative changes in cognition and mood, and increased arousal in a person. This group of symptoms can indicate the presence of Post-Traumatic Stress Disorder (PTSD) (3).

In the past decades, researchers have been attracted to the positive effects of suffering from diseases and extremely traumatic events and their effect on adopting a constructive approach. Life-threatening diseases, in addition to psychological disorders, may also be associated with positive changes. Positive

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changes caused by traumatic events are called Post-Traumatic Growth (PTG), the experience or mental perception of positive psychological changes caused by a conflict with a stressful event (4). Understanding the concept of post-traumatic growth can help healthcare providers in care and help patients to better adapt to their stressful conditions. Patients who experience post-traumatic growth show positive and meaningful changes in their emotional and cognitive lives, which positively affect their behavior and performance. These positive changes can be caused by various psychological and personality factors that facilitate recognizing the stressful event for patients and create a positive view of the patient, the surrounding people, and their lifestyle (5).

One of the influential factors in positive change after trauma is resilience. Resilience is a gradual and dynamic process of growth and expansion of biological capacities that is formed in the face of life's emotional, social, and biological challenges. Compensation and repair of injuries help people face problems with more strength and power (6). Resilience includes coping and adapting to an unpleasant and dire situation, which indicates its importance as a type of personality factor and intervention that protects people in stressful situations, especially mental health, after being diagnosed with cancer or incurable conditions (7-10). One of the cognitive structures that can be effective in the growth of cancer patients after the injury is the locus of control, the internal and external locus of control has been proposed as an influential psychological variable in the field of health (11). People with an internal source of control, who consider themselves in control of their emotions, behavior, and life conditions, actively try to change and correct it and attribute their successes and failures to their internal factors. At the same time, people with an external source of control do not consider themselves in control of the circumstances and events of their lives and attribute them to external factors such as luck and fate. They experience more anxiety and stress than people with an internal locus of control (12). One of the components related to resilience and a source of control is the feeling of social health. Social health, as one of the dimensions of health, along with physical and mental health, has gained a wide role and importance. Health is not only being free from

physical and mental diseases, but also it refers to functions in social relations and thoughts about society. It is also considered the criteria for evaluating a person's health at the macro level of society (13). Regarding the increasing rate of cancer, the necessity of mental health in treatment adherence, and medical and psychological outcomes, the present study aims to answer whether factors of resilience, internal locus of control, and social health can predict post-traumatic growth in cancer patients.

### Materials and Methods

The statistical population of this correlational research included all people aged 18 to 65 with cancer in Mashhad-Iran, who participated in the research online through social networks (such as Telegram, WhatsApp, etc.). Inclusion criteria included having been diagnosed with cancer, being aged 18 to 65 years, having the literacy to fulfill the questionnaires, and having access to the internet. The exclusion criteria included having major psychiatric problems, substance abuse, and unwillingness to continue the research. The online method was chosen due to the traffic restrictions when the risk of coronavirus became serious in Iran and to preserve the patient's health. All 212 people (143 women and 69 men) who completed the questionnaires were selected due to the unknown and lack of statistical population size (number of cancer patients). After explaining the purpose of the research and considering the ethical principles of participating in the research, including the confidentiality of information, all subjects who met the criteria for entering the research were asked to answer the questionnaires.

### Research instruments

*A) Demographic Information Questionnaire:* This questionnaire contains items about age, gender, educational level, marital status, place of residence, and duration of cancer.

*B) Post-Traumatic Growth Inventory (PTGI):* Tedeschi and Calhoun developed this questionnaire in 1996. It has 21 questions with a six-point Likert scale (0= not at all to 5= a lot). Tedeschi and Calhoun have established a high correlation between post-traumatic growth, its factors, and personality. They found a positive relationship between post-traumatic growth and optimism, spirituality, and other personality dimensions. They reported that Cronbach's alpha was equal to 0.98 (14). Heidarzadeh and

colleagues showed acceptable goodness of fit indices for this inventory and the 5-factor structure of the post-traumatic growth list. The Cronbach's alpha coefficient for the whole instrument was 0.87, and the correlation between the two test implementations with an interval of 30 days in 18 samples was 0.75 (15).

C) *Connor-Davidson Resilience Scale (CD-RISC)*: This scale was designed by Connor and Davidson to measure resilience and was prepared from 25 items with five options (0= never to 4= always). They reported the psychometric properties of this scale as acceptable (16). Abdi et al. investigated the psychometric properties of the resilience scale in women with cancer. They obtained Cronbach's alpha coefficient of 0.94 for the total scale, which indicates high internal consistency, and also estimated good reliability (17).

D) *Locus of Control Questionnaire (LOC)*: This questionnaire was developed by Rotter (1966) to measure people's expectations in the locus of control (internal and external) with 23 questions. The respondents answer each item on a five-point Likert scale (1= completely incorrect to 5= always correct). Rotter confirmed the validity of the items by correlating each item with the total score of the test and its reliability with the test-retest coefficient method of 0.83. Cronbach's alpha of this questionnaire was reported as 0.77 (18). In Ebrahimi et al.'s research, the validity of this scale with the Coder-Richardson method is 0.70, Cronbach's alpha is 0.85, and the reliability with the test-retest method is 0.73 (7).

E) *Keyes Social Health Questionnaire (KSWQ)*: Keyes and Shapiro's standard social

health questionnaire consists of 28 items, and the items are scored on a five-point Likert scale from (completely agree= 5 to disagree= 1). Its creators reported the validity to be above 0.70 (19). In Iran, Ajam reported the Cronbach's alpha for the total scale as 0.78 and for the subscales of social participation and social acceptance equal to 0.74, and 0.71 for solidarity, for social flourishing 0.70, and for social cohesion 0.77, which shows that this instrument has good reliability. Also, the content validity of this questionnaire has been confirmed (20).

**Results**

Two hundred twelve people (143 women and 69 men) participated in the present study. The means of age in men were  $41.21 \pm 7.54$  years, and in women,  $47.43 \pm 6.75$  years. Regarding marital status, 83 people are single, and 129 are married.

In terms of education status, 70 people have diplomas and sub-diplomas, 24 people have postgraduate degrees, 50 people have bachelor's degrees, 38 people have master's degrees, and 30 people have doctorate education. Regarding residence, 128 people live in the city, and 84 live in the village.

In terms of the duration of the disease, 34 people had the disease for at least six months, 25 people for six months to one year, 25 people for 1-2 years, 20 people for 2-3 years, 30 people for 3-4 years, and 78 people for more than four years that they have been diagnosed with cancer or are aware of its existence. Table 1 reports the indicators of descriptive statistics and Pearson correlation between research variables.

**Table 1.** The descriptive statistics and correlations of resilience, locus of control, social health, and post-traumatic growth

Variable	Mean	SD	Resilience	Locus of control	Social health	Post-traumatic growth
Resilience	29.10	7.62	1			
Locus of control	14.15	4.87	0.28**	1		
Social health	53.98	11.48	0.85**	0.28**	1	
Post-traumatic growth	79.13	12.38	0.84**	0.25**	0.90**	1

\*\*P< 0.01

The table above showed that the Pearson correlation coefficient results show a positive relationship between all research variables ( $P < 0.01$ ). A multiple regression test was used to predict post-traumatic growth based on predictive variables in the next step. Before running the regression analysis, checking the assumptions of this analysis showed that there

was multiple normality between the scores of the variables, the relationships between the variables were linear, and there was no multiple collinearity. The value of Durbin Watson's index was 1.52, which suggests that the assumption of independence of the variables error is respected and maintained. Also, indulgence and variance inflation indices have

reached the necessary limit. Therefore, the assumption of colinearity of predictor variables is rejected, and the correlation of predictor variables does not affect the findings. The

following summarizes the findings related to the regression model in Table 2. Also, the results of multiple regression coefficients are presented in Table 3.

**Table 2.** The summary of the regression model

Source of changes	Sum of squares	Freedom degree	Mean of squares	F	P
Regression	7018.80	3	2339.60	160.18	0.0001**
Error	1460.57	100	14.60		
Total	8479.37	103			

\*\* $P < 0.01$

**Table 3.** The results of multiple regression coefficients

Predictor variable	B regression coefficients	SE	$\beta$ regression coefficients	t	P
Fixed amount (a)	27.41	1.76		15.56	0.0001**
Resilience	0.43	0.088	0.26	4.96	0.0001**
Social health	0.73	0.058	0.68	12.58	0.0001**
Locus of control	-0.040	0.074	-0.016	-0.53	0.59

\*\* $P < 0.01$

As the results of the multiple linear regression test in the above table show, predictor variables can predict growth after trauma in cancer patients ( $P < 0.001$ ,  $F = 360.84$  (208,3)). Resilience, locus of control, and social health predict post-traumatic growth.

As can be seen in the above table, the beta coefficient ( $\beta$ ) or the standardized regression coefficient of the resilience predictor variable is equal to 0.26, which is significant at the alpha level of 0.001 ( $P < 0.001$ ,  $t = 4.96$ ,  $\beta = 0.26$ ). Therefore, this finding shows that the resilience variable alone can positively predict post-traumatic growth in cancer patients. Also, the findings show that the beta coefficient ( $\beta$ ) of the social health predictor variable is equal to 0.68, which is significant at the alpha level of 0.001 ( $P < 0.001$ ,  $t = 12.58$ ,  $\beta = 0.68$ ). This finding shows that the social health variable alone can positively predict post-traumatic growth in cancer patients. However, the control source variable cannot predict growth after trauma in cancer patients ( $P = 0.59$ ,  $t = -0.53$ ,  $\beta = -0.016$ ).

## Discussion

The present study aimed to predict post-traumatic growth based on cancer patients' resilience, locus of control, and social health. The results showed that although all three variables have a significant positive relationship with post-traumatic growth in bivariate correlation when evaluating these three variables simultaneously, only resilience and social health were important predictors of post-traumatic growth. The results of the

research showed that there is a relationship between resilience and post-traumatic growth. This finding is in line with the research by Babazadeh et al. (21), Ewert and Tessner (22), Nuccio and Stripling (23), Aafjes-van Doorn, et al. (24), and Parry et al. (25).

Finally, the research findings showed a relationship between social health and post-traumatic growth. This finding is consistent with the research findings of Ahmadi et al. (26), Shin and Kang (13), and Hasselle et al. (27). In the research by Zhang et al. on 540 patients with a lung cancer diagnosis in China; the results showed that social support could positively impact on post-traumatic growth in these patients (28).

People's participation in supporting groups, participation in collective work, and spending more time with family members, friends, and others all through increasing the social health of people. Social support, as well as obtaining more information about the problem, improves acceptance behaviors and growth after experiencing the disease (27). In our study, the locus of control cannot predict post-traumatic growth in cancer patients. While in contrast with our findings, Hassell et al. studied 137 pregnant women who experienced partner violence. They revealed that more social support increased resilience in these women, while more external locus of control is associated with lower resilience in women with low-income family support (27). In addition, Hosseinigolafshani et al. studied 196 patients with breast cancer. The results showed that

most patients had an external locus of control. Also, they revealed a significant and reverse relationship between post-traumatic growth and external locus of control (29).

These findings differed from our results, which may be related to the external locus of control in most of the participants of Hosseinigolafshani et al. study. In this line, Babazadeh et al. investigated 200 women with breast cancer in Iran. These patients fulfilled Perceived Social Support Scale, the Connor-Davidson Resilience Scale, and the Post-traumatic Growth Inventory. Based on the findings, social support through the mediating role of resilience impacts post-traumatic growth (21). In this line, Tang et al. assessed 3860 adolescents in China through the adolescent self-rating life events checklist scales, the resilience scale for Chinese adolescents, the social support rating scale, and the adolescent quality of life scale. They found that negative life events negatively impact the quality of life. At the same time, resilience and social support mediate in decreasing these adverse effects and improving the quality of life after traumatic events (30). These findings support our findings and emphasize the role of resilience and social health on post-traumatic growth after adverse life events. The limitations of the present research are quantitative research methods and

the need for more tools, such as interviews. Considering the conditions of the time of conducting the research and the COVID-19 pandemic, the questionnaires were fulfilled online. Based on the findings of this research, it is suggested that considering the significant relationship between resilience and post-traumatic growth, holding workshops and psychological training sessions focusing on managing stress and emotions can help significantly in maintaining the morale of cancer patients. Also, forming associations and developing communication networks for special patients, including cancer patients, as well as creating a culture to adapt to all kinds of mental problems of these patients, can be a positive step to increase the feeling of hope and deal with the fear of being pushed out of the society.

### Conclusion

Therefore, if resilience and social health are more, it can predict post-traumatic growth in cancer patients.

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