



# Relationship between locus of control and post-traumatic growth in women with breast cancer

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## Abstract

**Introduction:** Currently, instead of focusing on negative outcomes of breast cancer, researchers concentrate on potential positive outcomes which refer to post-traumatic growth (PTG).

**Objectives:** The aim of this research was to investigate PTG and its relation with the locus of control (LOC) in women with breast cancer

**Patients and Methods:** The samples in this descriptive, correlational research contained 196 participants with breast cancer, who were referred to an oncology center in Qazvin, Iran. Data were collected using the demographic characteristics questionnaire, PTG inventory, and LOC scale. Pearson's test was applied to assess the relation between PTG and LOC.

**Results:** The mean PTG score was  $61.43 \pm 12.06$ , which indicated some degrees of growth in all the participants. Regarding LOC, the majority of the participants (74.5%) were external and the minority of them (25.5%) were internal. The Pearson's correlation coefficient demonstrated a significant reverse relationship between PTG and external LOC in the participants ( $P < 0.05$ ;  $r = -0.253$ ).

**Conclusion:** The significant negative correlation between PTG and external LOC can help health staff, managers, and politicians to enhance the psychological health of women with breast cancer.

**Keywords:** Locus of control, Post-traumatic growth, Breast cancer

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## Introduction

Cancer is one of the prevalent and important diseases in the world. Today, despite great success in cancer treatment, it is however comprehended as a life-threatening situation (1). Breast cancer is the most prevalent sort of cancer among women in all countries of the world (2). Breast cancer is one of the major public health concerns due to its high prevalence, cost of treatment and rehabilitation, and effect on decreased quality of life (3). In addition, based on the role of breast as a significant identification of femininity, such patients are more traumatized and need stress relief treatments (4). Using multiple treatments for example chemotherapy, radiotherapy and surgery causes more physical and psychological complications (5).

Post-traumatic growth (PTG) is a concept presented by Tedeschi and Calhoun, referring to useful alteration in emotions and cognition

## Key point

In the study on 196 participants with breast cancer referring to an oncology center in Qazvin, we found a significant negative correlation between post-traumatic growth and external locus of control. This finding can help health staff, managers, and politicians to enhance the psychological health of women with breast cancer.

that result in changes in behavior. This theory also refers to useful alterations in the individual and psychological aspects that have occurred following an unpleasant occurrence. However, the consequence of an individual fight with this event is challenging (4).

The conception of the meaning of PTG facilitates individuals to reconcile to the tension and show useful results on their demeanor and function. In fact, PTG helps to diagnose the crisis and to lead useful

alterations in people's psychological aspects, which will have a positive effect on their demeanor, function, and manner of living (5, 6).

PTG is a circumstance that perhaps appears in cancer people. Tedeschi and Calhoun recognized five dimensions for PTG; 1. New situations, 2. Communication with others, 3. Personal empowerment, 4. Spiritual development, and 5. Valuing life (6).

Focusing on the potential useful outcomes of tension could supply many advantages to experts who work with patients in terms of contributing to the compatibility process (4).

One of the important psychological variables in the field of health is the locus of control (LOC), which first time introduced through Rutter and is defined as the degree to which people expect that outcomes are dependent on their own demeanor or personal properties, as adverse to a function of opportunity, odds, luckiness, and fortune, be under the control of others' strength or be simply undeterminable. LOC is the basis of the individual's belief that the positive and negative events and events of their life are dependent on it (7).

The LOC concept consists of two aspects, internal and external LOC. People with internal LOC think that life events are voluntary and they are responsible for their occurrence. On the other hand, individuals with external LOC think that life events are influenced by external power factors such as luck, chance, destiny and the power of others. Generally, individuals with internal LOC are more consistent in their lives than those with external LOC. Moreover, people with internal LOC think that their rewards depend on their demeanor and performance and thus attempt to control their destiny. However, people with external LOC find life events under the control of foreign forces. These people have more social, educational and professional problems, and show aggressive and irritable behaviors in their social relationships (7, 8).

## Objectives

The purpose of the current research was to peruse the PTG and its relation with LOC in women with breast cancer.

## Patients and Methods

### Study design and population

A descriptive, correlational design was applied to investigate the relation between LOC and PTG. A convenience sampling method was applied to select patients who were referred to the largest oncology center (Velayate) under supervision of the Qazvin University of Medical Sciences, Qazvin (April to September 2018).

A total of 196 patients (87%, response rate) were enrolled in the study as per the following inclusion criteria: (I) Detection of primary breast cancer in the last five years; (II) The propensity to take part in the research; (III) Ability to answer questions accurately; and (IV) No history of severe stress in the last month (death of relatives,

accident or unemployment).

We excluded 19 participants who did not have all inclusion criteria and eight participants who did not have the inclusion criteria number I; three participants did not have the inclusion criterion number III; two participants did not have the inclusion criterion number IV, and six participants avoided take part in the research.

### Sample size

The number of samples was obtained using the following statistical formula, with regard to  $\alpha=0.05$  and  $d = 0.14 \times 14.7 = 2.05$ .

$$n = \frac{z_{1-\frac{\alpha}{2}}^2 \times \sigma^2}{d^2} = \frac{1.96^2 \times 14.7^2}{2.05^2} = \frac{829.78}{4.23} = 196$$

### Instruments

The questionnaires applied in the current research involved a demographic questionnaire, post-traumatic growth inventory (PTGI), and the LOC scale (LOCS).

Demographic characteristics included information concerning participants' age, marital condition, educational status, time of diagnosis and method of method remedy (surgical operation, chemotherapy, and radiotherapy). The validity of this tool was approved by nursing and midwifery faculty members.

### The post traumatic growth inventory (PTGI)

PTGI assessed development relevant alteration perceived by vulnerable peoples. This 21-subject questionnaire assesses five domains of PTG including 1) new situations, 2) communication with others, 3) personal empowerment, 4) spiritual development, and 5) valuing life. The range of values starts from 0 (I never experienced this condition as an outcome of my disaster) to 5 (I entirely perceived this alteration often excessive). The total score of the questionnaire is 0-105, which means that a higher score indicates more PTG experience. Tedeschi and Calhoun demonstrated that the internal reliability of the tool was 0.90 and the test-retest consistency with a 2-month interval was 0.71 (6, 9).

### Locus of control scale (LOCS)

In this study, the researcher used the Rotter's scale including 29 items to measure LOC. The Rotter's scale measures two different types of LOC; internal and external (10). The total score ranged between 0 to 23. Higher scores (9 to 23) indicate that individuals more likely possess external LOC and lower scores (less than 8) show that individuals possess internal LOC. In this scale, questions were structured by statements with two choices for each answer.

### Ethical issues

The research was adopted based on the Declaration of Helsinki and its latest reformation. Moreover, the research

was approved by the vice-chancellor for research of Qazvin University of Medical Sciences (Ethical code# IR.QUMS.REC.1396.342). All patients participating in the research were notified about the goals and methods of the research. Participation was discretionary and would not influence medical care before signing informed consent.

**Statistical analysis**

Data were analyzed by SPSS (version 24). Descriptive analysis, frequency, mean and standard deviation (SD) were applied to analysis of the participating patients' demographic characteristics. Inferential statistic (Pearson's test) was applied to appraise the relation between PTG and LOC. The significance level was set as  $P < 0.05$ .

**Results**

**The socio-demographic characteristics of the women**

The personal and treatment characteristics of the participants are reported in Table 1. The research was conducted with the participation of 196 women with breast cancer. The mean age was  $49.6 \pm 11.7$  years. The majority of the participants 178 (90.8%) were married. In terms of education, 66% (n=131) had diploma and 74% (145) were housewives. With regard to treatment characteristics, 67.3% (n = 132) were non-metastatic and 37.2% (73) were

treated with both chemotherapy and surgery (Table 1).

**The post-traumatic growth (PTG) and its dimensions**

Table 2 depicts a comprehensive explanation of scores of PTG and its aspects in the study participants. In this research, the mean score of PTG was  $61.43 \pm 12.06$  that displayed development in whole the women with breast cancer. The uppermost score was reported for the aspects "spiritual development" and "new possibilities".

**The locus of control (LOC) and its dimension**

Table 3 reveals a comprehensive explanation of scores of LOC and its aspects in the study patients. In this research, the mean score of LOC was  $11.16 \pm 4.6$ . With regard to the sub-scales of LOC (internal or external), the finding displayed that the majority of the patients (74.5%) had external LOC and 25.5% had internal LOC.

**The relation between LOC and PTG**

Table 4 presents the relationship between LOC and its aspects with PTG and its dimensions. The finding displayed that Rotter-external LOC had a negative correlation with all the components of PTG and all correlations were significant ( $P < 0.001$ ). Thus, participants who scored higher in PTG had lower external LOC. This finding indicates that PTG is associated with internal LOC. Therefore, the hypothesis of PTG correlation with Rotter's external LOC was accepted.

**Discussion**

This research was performed to assess the correlation between LOC and PTG in women with breast cancer. The findings demonstrate that the mean score of total PTG was higher than average ( $61.43 \pm 12.6$ ) among the participants. In line with the current study, Jansen et al reported that the mean total score of PTG was higher than average in people with cancer (11). However, the outcomes of the research by Morris et al displayed that the mean total score of PTG was low in participants with cancer (12). Despite the cultural diversity among the people in the above studies, the findings of the current research confirm the theoretical basis of PTG, which suggests that exposure to stressful conditions like cancer diagnosis can be associated with growth experience and its aspects.

According to the results of this study, among the five investigated fields in PTG, the highest mean scores were

**Table 1.** The demographic and treatment variables (N=196)

Variables	Categories	Frequency	Percent
Age (y)	Mean $\pm$ SD	49.6 $\pm$ 11.7	
	Single	13	6.6
Marital status	Married	178	90.8
	Divorced	2	1.0
	Widowed	3	1.5
Education status	Illiterate	43	21.9
	Diploma	131	66.8
	Collegiate	22	11.2
Occupation	Employed	24	12.2
	Freelance	27	13.8
	Housewife	145	74.0
Type of treatment	Chemotherapy	26	13.3
	Radiation therapy	2	1.0
	Surgery	10	5.1
	Chemotherapy & radiation therapy	15	7.7
	Chemotherapy & surgery	73	37.2
All	70	35.7	

**Table 2.** The PTG score and its dimensions in the women with breast cancer

	Number of items	Minimum	Maximum	Mean	SD	Mean score of items in each dimension
Personal strength	4	4.00	18.00	11.6990	2.92228	2.9
Spiritual changes	2	1.00	10.00	6.2908	1.82071	3.14
Appreciation of life	3	1.00	15.00	7.2908	2.98923	2.43
Communication with others	7	9.00	33.00	20.5510	4.34328	2.93
New possibilities	5	6.00	24.00	15.6020	3.78456	3.12
PTG	21	27.00	90.00	61.4337	12.06864	2.92

**Table 3.** The LOC score and its dimensions in the women with breast cancer

	Categories	Frequency	%	Min	Max	Mean	SD
LOC	Internal (n=50)	50	25.5	1	8	8.2	5.2
	External (n=146)	146	74.5	9	21	21	13.19
	LOC overall	196	100	1	21	11.16	4.6

**Table 4.** The relationship between locus of control and its dimensions with post-traumatic growth and its dimensions in the women with breast cancer

		PTG						
		Communication with others	New possibilities	Personal strength	Spiritual changes	Appreciation of life	PTG overall	
LOC	Internal (n=50)	R	0.071	0.197	0.125	0.163	0.106	0.167
		P	0.624	0.171	0.386	0.258	0.463	0.247
	External (n=146)	R	-0.237	-0.167	-0.212	-0.271	-0.209	-0.284
		P	0.004*	0.044*	0.010*	0.001*	0.011*	0.001*
	LOC overall	R	-0.156	-0.177	-0.218	-0.174	-0.254	-0.253
		P	0.029*	0.013*	0.002*	0.015*	0.000*	0.000*

\* It means meaningful correlation.

relevant to the scopes of “spiritual development”, “new situations” and the lowermost one was relevant with the “valuing life”. This shows that the patients had the highest growth in the scopes of “*spiritual development*” and “*new situations*”, but the lowest growth in the “valuing life” scope. However, the studies of Bellizzi et al, Morris et al and Brix et al are in contrast with our findings. They found that the “*spiritual development*” scope had the lowest growth in cancer patients (12-14). On the other hand, Teodorescu et al concluded that Norwegian immigrants had the lowest growth in “*new situations*” scope but the highest growth in the “*valuing life*” scope (15). The inconsistent findings of studies about the experience of various scopes of PTG in different societies can be logically expected due to different cultures, religions, and social values, which need more and deeper investigation with a qualitative approach.

Regarding LOC, the findings of our research indicated that the majority of the participants (74.5%) used external LOC. Rutter believes that individuals with external LOC claim that life events are under the control of foreign forces such as luck, fortune, destiny, and the power of others. These people have more social, educational and professional problems. Moreover, they show aggressive and irritable behaviors in their social relationships (7).

In line with this study, Iskandarsyah et al reported that women with breast cancer more likely used external LOC while healthy women were more inclined toward internal LOC (16). Unlike the current study, Akça and Yaman stated that internal LOC was more than external on in teachers (17).

Demir et al believe that people with internal LOC are more targeted, have better reactions to issues, have higher self-esteem, generally have a healthier and more productive life, and are more satisfied with their lives (18). Based on this finding, it appears that the patients of this study who selected the external LOC approach were under high stress

and psychological pressure, had less compatibility with the conditions, and highly needed professional help to improve their mental health.

Moreover, the findings of the research displayed a significant negative correlation between PTG and LOC ( $P < 0.05$ ). Therefore, by increasing PTG scores, patients move toward internal LOC and by reducing PTG scores, they move toward external LOC. A study conducted by Weiss showed that LOC (internal and external) can affect the health and compatibility with disabilities in SCI. The results showed a significant positive relationship between external LOC with PTG disorder in participants with spinal cord injury (19,20).

However, contrary to the current study, Weiss et al and Önder concluded that women with breast cancer who had high PTG scores had external LOC (19,20). Considering the characteristics of people with internal LOC, researchers such as Baglama and Atak expected to experience more growth in dealing with stress and disaster. However, the findings of the research displayed that no significant difference was detected in PTG scores between two groups of internal and external control (4).

The inconsistent findings of the above studies may be due to the gender of the participants and the difference in responding to challenging life issues. Hence, women often resolve challenging issues with more interactions and external agents while men tend to have fewer interactions and internal agents in dealing with their challenging issues.

## Conclusion

The results of current research showed that most women with breast cancer used the external LOC approach when exposed to life challenges. According to the literature, this approach can result in high psychological pressure and requires the attention of managers and policymakers to make some strategies to adjust this ineffective approach.

The findings of this research also indicated that all the aspects of PTG had a significant negative relation with external LOC, meaning that patients with more growth experience more likely used internal LOC. It is recommended to perform further and deeper investigation with a qualitative approach in different cultures to achieve a basic principle related to these two valuable variables.

### Limitations of the study

The mental state of participants at the time of response is one of the uncontrollable limitations of the study.

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### Authors' contribution

SZG was the principal researcher. LK collected the data and wrote the first draft. MM analyzed the data. SZHG as the leadership team planned the study and read and revised the final draft. SMZ and AD collected the data and assisted in writing the final draft.

### Conflicts of interest

The authors declare no conflict of interest.

### Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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