The Mediating Role of Illness Perception between Emotion Regulation and Post-Traumatic Growth among Breast Cancer Patients in Pakistan

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ABSTRACT: The purpose of the current study was to investigate the relationship among post-traumatic growth, illness perception and emotion regulation among breast cancer patients. The following scales were administered: the Posttraumatic Growth Inventory (PTGI), Brief Illness Perception Questionnaire (B-IPQ), and Emotion Regulation Questionnaire (ERQ). A total 100 breast cancer patients (N=100) by using correlational cross sectional research design were selected through random sampling. The data were analyzed using the SPSS software program. The research aims to examine how illness perception and emotion regulation influence the development of post-traumatic growth after a cancer diagnosis, particularly focusing on psychological adaptation and positive changes during survivorship. The results showed a significant positive correlation between emotion regulation and post-traumatic growth and a negative correlation between illness perception and post traumatic growth. The study highlights the importance of optimistic illness perception and affective emotion regulation strategies in fostering growth and resilience among breast cancer patients.

KEYWORDS: Post-traumatic Growth, Illness Perception, Emotion Regulation, Breast Cancer Patients

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Introduction

Breast cancer is the most predominant cancer that affects women. In 2020, international datasets stated that breast cancer outdid pulmonary carcinoma as the predominant cancer worldwide; in the same year, 11.7% of cases were counted as breast cancer (Sung et al., 2021). People with breast cancer, which is a long-lasting disease, commonly face mental burden, which contributes to limited life satisfaction and diminished wellbeing (Zahraie, 2018). The incidence of breast cancer is a complex process that includes multicellular (factors Xu et al., 2023).

Among all Asian countries, breast cancer has the highest incidence in Pakistan (Bhurgri et al., 2006). Age-standardized mortality rate is 25.2 per 100,000 in Pakistan, which is the highest ratio throughout all South Asian countries (Feraly et al., 2010). At the time of progression of breast cancer, people often experience mental distress such as nervousness, hopelessness, and desperation. In most cases, people feel severe psychological vulnerability and emotional disturbance (Kangas et al., 2014).

Research shows that cancer patients experience post-traumatic growth, which is described within three years of diagnosis (Morris et al., 201The studytudy yields bodily and mental well-being for patients through related health

activities, including better nutritional habits, developed somatic action levels, and delicate workplace welfare awareness (Lim, 2019).

Traumatic incidents can commonly fall into categories caused by human actions and incidents linked to non-human factors. Incidents generated by human actions include rape, bodily assaults, and corresponding incidents, whereas incidents linked to non-human factors are considered natural hazards, illness, and unintended events. Researchers examine incidents that occur due to human action contributing to psychological disturbance, like post-traumatic stress disorder. Researcher reported that those distressing experiences that human do not caused with intent, cancer Illness perception may be affecting long term survival which involves individual personal beliefs and mental perception about their illness including its symptoms, possible causes, duration, course of the disease and possible consequences (Broadbent et al., 2015; Leventhal et al., 2011).lay a significant role in the study of psychological trauma. (Türksoy et al., 2003).

Emotion regulation describes the process by which an individual adjusts the strength, duration, and outward expression of emotions (Gross & John, 2003). Emotion regulation involves two main domains: the first is cognitive restructuring, and the second is emotion suppression. Cognitive restructuring refers to cognitive modification through which individuals change their attention from harmful features of trauma to the beneficial features (Nes, 2006).

Objectives of the Study

1. To examine the association between illness perception and post-traumatic growth among breast cancer patients.
2. To investigate the role of emotion regulation in influencing post-traumatic growth among breast cancer patients.
3. To explore whether illness perception mediates the relationship between emotion regulation and post-traumatic growth.

Hypotheses:

1. Illness perception is negatively correlated with post-traumatic growth among breast cancer patients.
2. Emotion regulation is positively correlated with post-traumatic growth among breast cancer patients.
3. Illness perception will mediate the relationship between emotion regulation and post-traumatic growth among breast cancer patients.

Method

Research Design

A correlational research (cross-sectional) design was used as per the requirements of the study.

Sample Size

To investigate the impact of illness perception, emotion regulation, and post-traumatic growth among breast cancer patients, a purposive sampling technique was selected. Accordingly, a total of 100 breast cancer patients were selected for this study.

Inclusion Criteria

- Females who have been clinically identified with breast cancer by a qualified oncologist.
- Patients aged between 18 and 65 years, capable of provided that informed consent.

Exclusion Criteria

- Patients diagnosed with severe psychiatric disorder.
- Patients who have experienced a major unrelated traumatic event.

Instruments

The following scales were used for data collection.

Posttraumatic Growth Inventory (PTGI)

The post traumatic growth inventory (PTGI) scale was developed by Tedeschi and Calhoun in (1996) to evaluate positive psychological transformation experienced by individuals after trauma. The original scale consists of 21 items shared into five dimensions. The scale has shown good reliability, with Cronbach's alpha coefficient typically around 0.90 (Tedeschi & Calhoun, 1996).

Brief Illness Perception Questionnaire

The brief illness perception questionnaire is a short self-report instrument developed by Elizabeth Broadbent and colleagues. It is used in research to assess an individual's cognitive and emotional representations of their illness.

Emotion Regulation Questionnaire

The Emotion Regulation Questionnaire is a generally used self-report tool developed by James J. Gross and Oliver P. John. This instrument is designed to assess how individuals regulate their emotions, particularly through two key strategies: cognitive reappraisal (changing the way one thinks about a situation to alter its emotional influence) and expressive suppression (inhibiting the external expression of emotions). This questionnaire consists of 10 items rated on a Likert scale.

Procedure

Patients diagnosed with breast cancer were selected from the oncology department of IRNUM and Khyber Teaching Hospital Peshawar. A total of 100 Participants were selected. The scales used in the study were the Posttraumatic Growth Inventory (PTGI) and the Brief Illness Perception Questionnaire (BIPQ). Informed consent was obtained, rapport was established with each participant, and detailed instructions were provided. The questionnaires were administered, and participants were monitored to ensure complete and accurate responses. Once the forms were filled, they were collected and checked for completeness. At the conclusion of the study, Participants and the hospital administration were thanked for their cooperation.

Operational Definitions

Post-traumatic Growth in Breast Cancer Patients

Post traumatic growth (PTG) is the experience of positive psychological change that breast cancer patients undergo after confronting the challenges of diagnosis, treatment, and recovery. It reflects the individual's ability to derive meaningful benefits from adversity leading to enhanced personal relationships, a renewed sense of self-strength, altered life priorities, and a deeper appreciation of existence (Tedeschi & Calhoun, 1996).

Illness Perception in Breast Cancer Patients

Illness perception among breast cancer patients refers to the patient's cognitive and emotional demonstrations of their illness, including beliefs about its concerns, duration, controllability, symptom experience, and level of concern, understanding, and emotional impact (Broadbent et al., 2006).

Emotion Regulation in Breast Cancer Patients

Emotion regulation among breast cancer patients refers to the practices through which people monitor, assess, and change their emotional reactions related to their illness experience (Gross & John, 2003).

Results

The results of the present study showed the relationship among post-traumatic growth, illness perception, and emotion regulation among breast cancer patients. First of all, the items were coded, and scores of the scales Post Traumatic Growth Inventory (PTGI), Emotion Regulation Questionnaire (ERQ), and Brief Illness Perception Questionnaire (BIPQ) were computed. The following steps were included for analyzing the data. In the first step, the scales were computed. In the second step the correlation was found between the study variables and demographics of the research. In the third step, regression analysis was done to assess the predictive role of emotion regulation and illness perception in post-traumatic growth. In the fourth step, mediation analysis was showed to inspect the mediating role of illness perception.

Table 1

Reliability Coefficients of Study Variables

Variables	K	A	M	SD	Range Minimum	Potential Maximum
PTGI	21	.733	60.29	10.722	37.00	97.00
ERQ	10	.806	41.30	10.53	23.00	68.00
BIPQ	8	.733	47.81	8.67	29.00	67.00

Note: K=No of items, M=Mean, SD= Standard deviation, A= Reliability.

Table 1 shows the values of mean, standard deviation, and reliability of a scale (PTQ, ERQ, and BIPQ). PTG = Posttraumatic Growth Inventory, ERQ = Emotion Regulation Questionnaire, BIPQ = Brief Illness Perception Questionnaire

Table 1 presents the descriptive statistics and reliability coefficients for the study variables. The Posttraumatic Growth Inventory (PTGI) comprised 21 items and demonstrated acceptable reliability (α = .73`, with participants reporting moderate levels of post-traumatic growth (M = 60.19, SD = 10.72, Range = 37–97). The Emotion Regulation Questionnaire `ERQ` consisted of 10 items and indicated good internal consistency `α = .81`, with respondents revealing moderate emotion regulation scores `M = 41.30, SD = 10.54, Range = 23–68`. The Brief Illness Perception Questionnaire `BIPQ` included 8 items and also confirmed standard reliability `α = .73`, with participants indicating moderate levels of illness threat perception `M = 47.81, SD = 8.67, Range = 29–67`. Overall, all three scales showed adequate to good internal reliability, with Cronbach's alpha values above the commonly recognized threshold of .70, indicating that the instruments were reliable for use in the current sample.

Table 2

Descriptive Statistics and Frequencies of Demographics (N=100)

Variables	N	%
Age		
From 18 to 30	15	14.9%
From 30 to 60	85	84.2%
Treatment		
Chemotherapy	36	35.6%
Radiotherapy	21	20.8%
Surgery	43	42.6%

Variables	N	%
Cancer Clinical Stage		
Stage I breast cancer	9	8.9%
Stage II breast cancer	43	42.6%
Stage III breast cancer	48	47.5%
Marital Status		
Married	79	78.2%
Single	20	19.8%

Note: MS = Marital status, CCS = Cancer clinical stage

Table 2 Shows, a demographic analysis of the breast cancer patients. The sample consist of 100 individuals (N=100). The age distribution shows that the majority of patients (84.2%) fill in the 30-60 years age range, while (14.9%) are between 18-30 years old. In terms of marital status, large populations of the sample (78.2%) are married, and only (19.8 %) are unmarried. Regarding cancer clinical stage, most patients are in stage III (47.5%) or stage II (42.6%), with a smaller percentage in stage I (8.9%). For treatment type, surgery is the most common (42.6%), followed by chemotherapy (35.6%), and radiotherapy (20.8%).

Table 3

Correlation among Study Variables (N=100)

Variables	1 PTGI	2 ERQ	3 BIPQ
1	_	.523**	-.751**
2		_	.215*
3			_

Note: PTGI = Posttraumatic Growth Inventory, ERQ= Emotion Regulation Questionnaire, BIPQ= Brief Illness Perception Questionnaire.

Table 3 presents the Pearson correlation coefficients among the study variables (N = 100). Results indicated that post-traumatic growth (PTGI) was significantly and positively correlated with emotion regulation (ERQ), r = .52, p < .01, suggesting that higher levels of emotion regulation are linked with greater post-traumatic growth. Equally, PTGI showed a strong, significant negative association with illness perception (BIPQ), r = -.75, p < .01, indicating that more hostile illness perceptions are associated with lower levels of post-traumatic growth. Additionally, ERQ and BIPQ were significantly negatively correlated, `r = -.22, p < .05`, implying that better emotion regulation is associated with less threatening illness perceptions. Overall, these correlations indicate that both emotion regulation and illness perception are significantly related to post-traumatic growth, with illness perception showing a stronger association.

Table 4

Regression Analysis Predicting Post-Traumatic Growth

Variables	B	Beta	SE	Sig (P)
Constant	76.238		5.250	<.001
ERQ	.549	.379	.082	<.001
BIPQ	-.994	-.669	.084	<.001
R2	.701			

Note: B= Regression coefficient, beta= Standardized Regression coefficient, SE= Standard Error, P = significance level, R2 = coefficient of determination.

Table 4 shows that multiple linear regression analysis shown that emotion regulation and illness perception significantly predicted post traumatic growth among patients, `F(2,97) = 113.57, p < .001`, with the model explaining 70.1% of the variance `$R^2$ = .701`. Emotion regulation `ERQ` emerged as a major positive predictor of PTGI `B = 0.55, β = .38, p < .001`, indicating that better emotion regulation is associated with higher post traumatic growth. Conversely, illness perception `BIPQ` was a significant negative predictor `B = -0.99, β = -.67, p < .001`, suggesting that more threatening illness perceptions are linked to lower posttraumatic growth. Standardized coefficients indicated that illness perception was a stronger predictor of PTGI than emotion regulation.

Table 5

Correlation Demographics and Study Variables

C	Age	CCS	Treatment	MS	PTGI	ERQ	BIPQ
Age	_	.080	.223*	-434**	-.090	-.167	.040
CCS		_	-.152	-.285**	-.214*	-.073	.321**
Treatment			_	-.060	-.122	.057	.038
MS				_	.005	.074	.063
PTGI					_	.523**	-.751**
ERQ						_	-.215*
BIPQ							_

Note: A= Age, CCS= Cancer Clinical Stage, MS= Marital Status, PTGI= Post Traumatic Growth Inventory, ERQ= Emotion Regulation Questionnaire, BIPQ= Brief Illness Perception Questionnaire.

Table 5 shows that a Pearson product–moment correlation analysis was conducted to examine the relationships among demographic variables and study variables, including age, cancer clinical stage (CCS), treatment status, marital status (MS), posttraumatic growth (PTGI), emotion regulation (ERQ), and illness perception (BIPQ). Age was positively associated with treatment status, r = .223, p < .05, and negatively associated with marital status, r = –.434, p < .01, indicating that older participants were more likely to differ in treatment status and were less likely to be married. Cancer clinical stage was negatively correlated with marital status, r = –.285, p < .01, and posttraumatic growth, r = –.214, p < .05, but positively correlated with illness perception, r = .321, p < .01, suggesting that advanced cancer stages were associated with lower posttraumatic growth and more threatening perceptions of illness. Posttraumatic growth was significantly and positively related to emotion regulation, r = .523, p < .01, indicating that greater use of adaptive emotion regulation strategies was associated with higher posttraumatic growth. In contrast, posttraumatic growth was strongly and negatively correlated with illness perception, r = –.751, p < .01, demonstrating that participants who viewed their illness as less threatening reported greater posttraumatic growth. Emotion regulation was also negatively associated with illness perception, r = –.215, p < .05, suggesting that better emotion regulation was linked to less negative perceptions of illness. No other correlations were statistically significant.

Table 6

Total, Direct, and Indirect Effect of Emotion Regulation on Post-Traumatic Growth through Illness Perception

Effect Type	Effect	SE	T	p	95%CI LL,UL
Total Effect	0.76	0.12	6.07	<.001	[0.51,1.01]
Direct Effect	0.55	0.08	6.66	<.001	[0.39,0.71]
Indirect Effect	0.21	0.21^a^	-	-	[-0.11,0.70]^b^

Note: N=100, SE=Standard Error, CI= Confidence Interval; LL= Lower Limit; UL= Upper Limit.

^a^ Boot SE = Bootstrap Standard Error for indirect effect. ^b^ Bootstrapped 95% CI based on 5000 samples.

Table 6 shows that Hayes' PROCESS Macro Model 4 was employed to inspect whether illness perception BIPQ mediated the relationship between emotion regulation ERQ and post traumatic growth PTGI. Results revealed a significant positive total effect of emotion regulation on post traumatic growth, Effect = 0.76, SE = 0.12, t = 6.07, p < .001, 95% CI [0.51, 1.01], indicating that higher emotion regulation was associated with greater posttraumatic growth. When illness perception was included as a mediator, the direct effect of emotion regulation on post traumatic growth remained significant, Effect = 0.55, SE = 0.08, t = 6.66, p < .001, 95% CI [0.39, 0.71]. However, the indirect effect of emotion regulation on posttraumatic growth through illness perception was not statistically significant, Effect = 0.21, BootSE = 0.21, 95% BootCI [-0.11, 0.70], as the bootstrap confidence interval contained zero. These findings suggest that although both emotion regulation and illness perception independently predict post traumatic growth, illness perception does not significantly mediate the relationship between emotion regulation and post-traumatic growth in the present sample.

Discussion

This study investigated the connections between illness perception, emotion regulation, and post-traumatic growth (PTG) in breast cancer patients. The findings suggest that adaptive illness perception and effective emotion regulation are positively associated with PTG, while illness perception also functions as an important psychological mechanism through which emotion regulation influences growth after trauma.

Results show that breast cancer patients who perceive their illness in a more positive and manageable way are more likely to report higher levels of post-traumatic growth. This result is reliable with the cognitive representation model suggested by Howard Leventhal and colleagues, which emphasizes that individuals' beliefs and understandings about illness shape their emotional and behavioral responses to health-related stressors. Patients who perceive their illness as understandable, controllable, and treatable may develop greater flexibility and hopefulness, allowing them to develop meaning from their cancer experience. Previous studies have similarly confirmed that positive illness perception is associated with better psychological adjustment, coping, and value of life among cancer patients (Leventhal et al., 2016; (Richardson et al., 2017).

The results also demonstrate that effective emotion regulation contributes significantly to post-traumatic growth among breast cancer patients. Emotion regulation states to the ability to monitor, achieve, and modify emotional reactions in adaptive ways (Gross, 1998). Patients who effectively regulate emotions through strategies such as cognitive reappraisal, acceptance, and positive reframing are more capable of coping with the emotional burden of cancer diagnosis and treatment. These adaptive emotional processes may reduce psychological distress and facilitate positive psychological transformation. This outcome supports with prior research showing that adaptive emotion regulation strategies are linked to increased resilience, psychological well-being, and PTG among individuals facing traumatic experiences (Gross & John, 2003; Yu et al., 2014).

In addition, the results indicate that illness perception plays a mediating role in the relationship between emotion regulation and post-traumatic growth. This indicates that individuals with stronger emotion regulation capabilities are more inclined to develop adaptive interpretations of their illness, which subsequently promotes PTG. Emotion regulation may help patients reduce catastrophic thinking and increase perceptions of personal control and hopefulness regarding their condition. These cognitive changes may encourage meaning-making and psychological growth following adversity. The mediating effect of illness perception underscores how emotional and cognitive processes interact in determining psychological adjustment among breast cancer patients. Comparable results have been documented in research highlighting that cognitive appraisal and emotional coping jointly contribute to PTG in cancer populations (Cordova et al., 2001; Morris et al., 2011).

The results of this study have significant clinical consequences. Healthcare specialists, particularly psychologists, counselors, and oncology nurses, may benefit from incorporating interventions that focus on enhancing adaptive emotion regulation and promoting positive illness perceptions among breast cancer patients. Cognitive-behavioral therapy, mindfulness-based interventions, and psychoeducational programs can help patients build healthier coping strategies and improve psychological well-being. Supporting patients emotionally and cognitively may not only reduce distress but also encourage personal growth and resilience during cancer recovery.

Numerous boundaries should be noted when understanding these findings. First, the reliance on self-report questionnaires may increase the possibility of social desirability and response bias. Second, the cross-sectional strategy bounds the ability to create causal relationships among variables. Longitudinal studies are recommended to track changes in illness perception, emotion regulation, and PTG over time. Furthermore, upcoming studies may include higher and more varied samples to improve the generalizability of the results across different social and clinical settings.

Recommendations

- Provide psychological counseling and support programs for breast cancer patients to improve illness perception and emotional adjustment.
- Incorporate therapies such as Cognitive Behavioral Therapy (CBT) and Acceptance and Commitment Therapy (ACT) to enhance emotion regulation skills.
- Conduct awareness sessions for patients and families to promote positive illness perception and coping strategies.
- Train healthcare professionals to address emotional and psychological needs alongside medical treatment.
- Develop hospital-based screening tools to identify patients with poor emotion regulation or negative illness perception early.

Limitations

The study's sample size was limited to breast cancer patients from two hospital, which may not be representative of the entire population. The findings may not be generalizable to patients with other types of cancer or to male breast cancer patients. The study relies on self-reported measures like PTGI, ERQ, and BIPQ, which may be subject to social desirability and recall biases. Data was composed at a single point in time, which limits causal inferences about the relationship between variables.

Suggestions

Future research should use longitudinal designs to examine changes in illness perception, emotion regulation, and post-traumatic growth over time. The researchers have to include participants from diverse cultural, socioeconomic, and educational backgrounds for broader applicability. For future studies the researchers also have to Use mixed-method approaches to gain a deeper understanding of patients' experiences and coping mechanisms.

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