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INTERNATIONAL JOURNAL OF PSYCHOTHERAPY PRACTIE AND RESEARCH
ISSN NO: 2576-612X

Research Article

DOI : 10.14302/issn.2574-612X.ijpr-18-2110

Investigation and Analysis on Mental Health State of Breast Cancer Patients in China

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Abstract

Purpose: There are nearly 170,000 new cases of breast cancer in China every year, and this number is showing an increasing trend. Mental health plays an important role in promoting the physical rehabilitation of patients. Therefore, attention paid to their psychological problems needs to be reinforced. The current study aims to investigate the mental health states of the breast cancer patients and provides the references for their psychosomatic rehabilitation in the future work.

Methods: A total of 643 breast cancer patients completed the whole study. A questionnaire survey on anxiety, depression, posttraumatic stress disorder (PTSD), and posttraumatic growth (PTG) was conducted in Jiangsu Women and Children Health Hospital.

Results: 13.53% breast cancer patients had anxiety; 21.5% had depression; the prevalence of PTSD was 7.15%, while the prevalence of PTG was 26.12%; Anxiety levels in older patients were significantly lower than those in the other two groups; PTG levels in older patients were significantly lower than those in the other two groups.

Conclusion: Breast cancer patients have certain emotional distress and stress symptoms, but they also experience psychologically positive changes. And age shows various differences on anxiety and PTG. Clinical medical personnel should pay attention to the patient's psychological rehabilitation when concerning about the physical rehabilitation of patients. Patients in different ages have different mental health problems, thus the medical staff shall provide differential nursing plans for them.

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Keywords: breast cancer; anxiety; depression; posttraumatic stress disorder (PTSD); posttraumatic growth (PTG)

Running title: Mental Health of Breast Cancer Patients

Received: May 02, 2018 **Accepted:** June 11, 2018 **Published:** June 20, 2018

Editor: Shuai Li, University of Cambridge.

Introduction

According to statistics, there are about 1.4 million new cases of breast cancer every year all over the world [1]. The incidence of breast cancer in China has surpassed the world and there are 170,000 newly diagnosed Chinese breast cancer patients each year [2]. Furthermore, this number is showing an increasing trend [2]. Of all cancers, breast cancer has become the most lethal disease with the exception of lung cancer among female [3].

Being diagnosed with breast cancer not only damages the physical function of the patients, but also has a negative impact on their mental health. They may experience a threat of physical integrity due to mastectomy and hair loss caused by chemotherapy. According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), threats of physical integrity and life-threatening illnesses are events that may traumatize individuals [4]. More than 75% patients with breast cancer were suffering from subclinical symptoms of posttraumatic stress disorder (PTSD) [5-6]. Patients with breast cancer may have persistent memory of surgical scars, avoid underwear advertisements, nightmares and other posttraumatic stress symptoms [7].

In addition, breast cancer patients are also suffering from different levels of negative emotions such as anxiety and depression. Fann et al. (2008) reviewed the evidence for the prevalence of depression in women with breast cancer from the last 20 years, and suggested that the incidence of depression is about 10% to 25% [8]. Literature had indicated that anxiety, which varied from 10% to 30%, is more common than depression among breast cancer patients [9-10]. Burgess et al. (2005) pointed out that the number of patients with depression and anxiety reached the maximum value in the first year after breast cancer diagnosis [11].

However, despite the initial negative posttraumatic response, research had also reported that breast cancer patients will experience positive changes [12]. One of the most typical positive changes is posttraumatic growth (PTG). Posttraumatic growth refers to a positive psychological change that occurs after individuals have fought against a disaster. It mainly includes changes in self-awareness, changes in interpersonal experience, and changes in life philosophy [13]. In addition, the study by Manne et al. (2004) also found that breast cancer patients' posttraumatic growth scores increased with postoperative time [14].

With the increase in medical conditions and living standards, the survival rate of breast cancer has risen [3]. The mental health of individuals after their illness may also change. Moreover，most epidemiological studies of breast cancer associated with mental disorder used tools such as screening scales to assess depressive symptoms rather than using diagnostic tools based on the DSM diagnostic criteria [15]. Therefore, Re-investigating the level of mental health of breast cancer patients under different cultural background is necessary. Clinical scales were used to investigate the mental health status of breast cancer patients in this study. In addition, we explored the influence of factors such as age and social stimulations on their mental health states.

Experimental Procedure

Questionnaires and informed consent forms were sent to the hospital for investigation by the research personnels, mainly graduate students. Researchers conducted a short interview with the patients and then the patients began to fill out the questionnaires. If the patient (infusion or bedridden) couldn't complete it by himself, the questionnaires will be read by the investigator and the patient gave the answers in oral. Most patients completed the questionnaires independently.

Materials and Methods

Participants

In this study, the participants were the hospitalized patients from the Mammary Department of Jiangsu Women and Children Health Hospital. A total of 643 patients were female patients. Inclusion criteria to the participants were: (1) voluntarily participated in the study and had signed the informed consent form; (2) had undergone breast cancer surgery and the clinical pathological diagnosis was Stage I-III breast cancer; (3) possessed no mental health problems, brain injuries and severe mental illness.

Measures

The Chinese version of Posttraumatic Stress Disorder Symptom Scale (PSS).

The applied questionnaire was the Chinese version of Posttraumatic Stress Disorder Symptom Scale, revised by Zhou et al. (2014) [16]. The original scale is Posttraumatic Stress Disorder Symptom Scale [17]. The scale contains 3 dimensions and 17-items, including Intrusion (5 items), Avoidance (7 items), and Hyper-arousal (5 items), which uses a 4-point Likert scoring of 0 ("Not a bit") -3 ("Always"). In this sample, the scale has a good internal consistency coefficient (α=.906).

The Chinese version of Posttraumatic Growth Inventory (PTG)

PTG levels were assessed using the Posttraumatic Growth Inventory [18]. The Chinese version of PTGI was revised and validated by Zhou et al. (2014) [16], and they added one item, "I have some more understanding of uncontrollable forces exist" on the basis of the original scale. The scale consists of 22-items evaluating three factors of PTG including Perceived Changes in Self (9 items), A Changed Sense of Relationships with Others (7 items) and Changed Philosophy of Life (6 items). Items were rated on a 4-point Likert scale ranging from 0 ("no change") to 5 ("very great degree of change"). This scale exhibited good reliability and construct validity for this study (α =.933), and yielded consistent measures for each subscale (Perceived Changes in Self, α = .861; A Changed Sense of Relationships with Others, α = .854; Changed Philosophy of Life, α = .799).

The Chinese version of Patient Health Questionnaire (PHQ-9)

The scale was developed based on the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-4) standard for the diagnosis of the major depressive disorder, which was used to assess the depressive symptoms of the past two weeks [19]. Yeung et al. (2008) translated the scale into Chinese and examined the reliability and validity [20]. The PHQ-9 has a single-factor structure with 9 items rated from 0 ("almost never") to 3 ("almost always"). Each item is a description of the symptoms of depression. The higher score reflects the severer depression tendency. The internal consistency was good for the present study (α = .853).

The Chinese version of General Anxiety Disorder Scale (GAD-7),

The Chinese version [21] of General Anxiety Disorder Scale [22] was adapted to measure the anxiety symptoms. The inventory consists of 7 items. All the items are rated on a 4-point Likert scale that ranges from 0 ("almost never") to 3 ("almost always"). The overall scale score is the sum of the 7 items score, and the higher the score, the more anxiety symptoms. In this study, the internal reliability of the modified inventory was good (α = .912).

Statistical analyses

Missing data across questionnaire items (< 4.5 % in overall data) were replaced by the series mean. Means, SDs, range, Cronbach's alpha coefficients, correlations of the scales, and ANOVA analysis in the current study were computed using SPSS 21.0. We used Harman's single factor test to examine common method bias [23]. All items relevant to the study were subjected to an exploratory factor analysis. The results show that 8 factors can be obtained, while no single factor accounts for a majority of the covariance among the variables. Therefore, no significant common method bias existed in the current study.

Results

Descriptive Statistics

The demographic and clinical information of the current sample were listed in Table 1. A total of 643 females completed the research, and the ages ranged from 26 to 73.

Negative psychological status in breast cancer patients

The scores of the GAD-7 and PHQ-9 scale indicated that the total score was greater than 10 points for best specificity and sensitivity [20-21]. We selected scores above 10 as the clinical diagnostic criteria for anxiety and depression in this study. According to the standard, there were 13.53% of breast cancer patients had anxiety, 21.5% of breast cancer patients had depression. According to the PTSD diagnostic criteria of DSM-4, individuals who meet all of the following conditions are considered to have "high risk of having

Table 1.Demographic statistics of subjects (N = 643).

Variables	M (SD) or N (%)	Variables	M (SD) or N (%)
Age(years)	48.78 (9.21)	Household monthly income	
Marital Status		<500 RMB (~73USD)	28 (4.35%)
Single	12 (1.87%)	500 - 1,000 RMB	42 (6.53%)
Married	599 (93.16%)	1,000 - 3,000 RMB	146 (22.71%)
Divorced	20 (3.11%)	3,000 - 5,000 RMB	144 (22.40%)
Widowed	9 (1.40%)	5,000 - 10,000 RMB	177 (27.52%)
Education		>10,000 RMB	67 (10.41%)
Primary school	112 (17.41%)	Medical history	
Middle school	174 (27.06%)	No	166 (25.82%)
High/Secondary School	163 (25.35%)	Yes	256 (39.81%)
Three -year college	89 (13.84%)	Unknown	210 (32.66%)
University or above	75 (11.66%)	Surgery history	
Number of children		Yes	279 (43.39%)
No children	28 (4.35%)	No	292 (45.41%)
One child	421 (65.47%)	Unknown	63 (9.80%)
Two children	162 (25.35%)	Treatment type	
≥Three Children	26 (4.04%)	Mastectomy	406 (63.14%)
Social stimulation		Breast Conservation Surgery	104 (16.17%)
Divorce	11 (1.71%)	Mastectomy and reconstruction	96 (14.93%)
Work/ Study pressure	102 (15.86%)	No treatment yet	28 (4.35%)
Spouse death	11 (1.71%)	Adjuvant therapy	
Family members' health	83 (12.91%)	Chemotherapy	547 (85.07%)
Marital Problems	23 (3.58%)	Radiotherapy	41 (6.38%)
No	413 (64.23%)	Endocrine therapy	32 (4.98%)

PTSD": firstly, at least 1 of the 5 items of Intrusion symptoms scores ≥ 2 points; secondly, at least 3 of the 7 items of Avoidance symptoms scores ≥ 2 points; thirdly, at least 2 of the 5 items of Hyper-arousal symptoms scores ≥ 2 points. The results suggested that the incidence of PTSD breast cancer patients in Jiangsu province was 7.15%. The specific results are shown in Table 2.

Positive psychological status in breast cancer patients

According to the studies of Tang (2006) and Xu et al. (2011), it was considered that individuals with a PTG score of ≥ 3 points had significant changes in this item [24-25]. The PTG questionnaire used in this study had a total of 22 items. Therefore, the PTG total score set ≥ 66 points as the critical value. According to the standard, the incidence of PTG in breast cancer patients was 26.12%. The ranking of average scores of each dimension of PTG from high to low was Changed Philosophy of Life, Perceived Changes in Self, A Changed Sense of Relationships with Others. The specific results are shown in Table 1.

The Comparison of Age and Social Stimulus of Mental Health of Patients with Breast Cancer

In this study, to investigate whether age differentiated of breast cancer patients' mental healths, patients were divided into three groups based on their ages, namely 26-40 years old, 41-60 years old, and 61-73 years old. The results suggested that anxiety scores were significantly different in three groups [F (2, 634) = 3.04, $p < 0.05$]. Further post hoc tests found that the anxiety scores between ages 26-40 and 41-60 were significantly higher than those between 61-73 years old in breast cancer patients [$t_{26\text{-}40\_61\text{-}73}$ (1, 184)=1.99, $p < 0.05$; $t_{41\text{-}60\_61\text{-}73}$ (1,522) =2.47, $p < 0.05$]. PTG levels were significantly different in age [F (2, 634) = 3.69, $p < 0.05$], and post hoc tests found that the PTG levels between ages 26-40 were significantly higher than those in other two older groups [$t_{26\text{-}40\_41\text{-}60}$ (1, 562) =2.37, $p < 0.05$; $t_{26\text{-}40\_61\text{-}73}$ (1,184) =2.31, $P < 0.05$].

We used ANOVA to text the destructive factor of mental health, socially stimulations, including Divorce, Work / Study pressure, Spouse death, Family members' health, Marital Problems, and None of them. A comparison of the effects of socially stimulating events on the mental health status of breast cancer patients revealed that anxiety scores were significantly affected by social stimulation [F (6, 636) = 4.64, $p < 0.001$]. Post hoc tests found that the anxiety scores of patients who had changes in Family members' health were significantly higher than patients who divorced ($p < 0.05$) and patients who had work / study pressures ($p < 0.05$). Depression scores were significantly associated with social stimulation [F (6, 636) = 2.63, $p < 0.05$]. Post hoc tests found that the depression scores of patients who had changes in Family members' health and experienced spouse death were significantly higher than patients who haven't stimulations ($p < 0.01$; $p < 0.05$). PTSD scores were significantly associated with social stimulation [F (6, 636) = 4.77, $p < 0.001$]. Post hoc tests found that the PTSD scores of patients who had changes in Family members' health, patients with work / study pressures and experienced spouse death were significantly higher than patients who haven't stimulations ($p < 0.001$; $p < 0.01$; $p < 0.05$). (Table 3)

Discussion

The current study aimed to investigate and analyses mental health for those who had been diagnosed with breast cancer. The incidence of anxiety and depression was 13.53% and 21.5% in breast cancer patients, which consist of previous research [8-10]. Anxiety is a response to future stimuli, which is a strong, uncertainty, and excessive fear. Being diagnosed with breast cancer and undergoing various treatments are a series of unpleasant and negative stimuli to the patient. Under such stimuli, the patient will experience anxiety symptoms accordingly. What's more, patients are often afraid of cancer recurrence even after the treatment. These persistent fears will stimulate anxiety among breast cancer patients also. Anxiety often coexists with depressive symptoms [26]. Cognitive evaluation theory pointed out that when individuals are in a stressful environment for a long period, they will produce inconsistent assumptions and coping styles with the outside world [27]. They may adopt negative cognitive methods, which to trigger depression. The treatment of breast cancer patients is a long-term process, and patients will continue to be stimulated by this source of stress. Breast cancer

Table 2. Status of mental health among breast cancer patients.

	Incidence (%)	M(SD)
Anxiety	13.53%	4.9 (4.24)
Depression	21.5%	6.5 (4.62)
Posttraumatic Stress Disorder	7.15%	12.1 (8.68)
Intrusion	—	3.7 (3.02)
Avoidance	—	4.5 (3.64)
Hyper-arousal	—	3.9 (3.00)
Posttraumatic Growth	26.12%	48.6 (22.97)
Changed Philosophy of Life	—	16.1 (8.15)
Perceived Changes in Self	—	13.2 (8.37)
A Changed Sense of Relationships with Others	—	12.8 (7.82)

Table 3. Differences in ages and social stimulations for mental health status.

	Anxiety		Depression		PTSD		PTG	
	M (SD)	F	M (SD)	F	M (SD)	F	M (SD)	F
Age		3.04*		0.01		1.11		3.69*
26-40	5.06 (4.48)		6.53 (5.05)		12.73 (9.73)		53.74 (25.67)	
41-60	5.09 (4.21)		6.51 (4.50)		12.24 (8.43)		47.94 (22.61)	
61-73	3.78 (4.00)		6.43 (4.89)		10.83 (8.70)		45.52 (20.05)	
Social stimulation		4.64***		2.63*		4.77***		1.73
Divorce	3.77 (2.98)		7.09 (5.47)		13.82 (9.35)		61.60 (30.48)	
Work / Study pressure	5.53 (4.46)		6.77 (4.60)		13.37 (9.16)		51.29 (23.79)	
Spouse death	5.16 (4.16)		9.45 (7.30)		17.09 (13.71)		52.89 (16.88)	
Family members' health	7.12 (4.84)		7.95 (5.18)		15.93 (8.84)		49.63 (22.18)	
Marital Problems	5.65 (4.10)		7.16 (5.40)		12.21 (7.61)		56.48 (25.36)	
No	4.39 (3.95)		6.05 (4.62)		10.89 (8.09)		47.10 (22.52)	

*p< 0.05; **p< 0.01; ***p< 0.001;

patients would catch in the whirlpool of negative emotions and produce depression in this long process of recovery.

The results showed that the incidence of PTSD was 7.15% in patients with breast cancer, which supported the previous studies [5, 28]. Kangas et al. (2002) summarized 10 evaluations of the incidence of PTSD in breast cancer patients and found that the incidence of PTSD in patients was between 5% and 10% [29]. Patients with breast cancer require the care of caregivers during a treatment process. The interactions with caregivers to help relieve their fears and obtain a lot of social support, which can alleviate the symptoms of PTSD [30-31]. On the other hand, the results of the study showed that the incidence of PTG reached 21.5%, and the number of breast cancer patients who had a positive psychological change after a traumatic stress event was relatively small. This is partly inconsistent with some previous findings, which may due to the time of this study that the patient who had just undergone surgery [32]. Danhauer et al. (2015) extended the time range of previous studies and found an average change in the PTG of a breast cancer patient over time: the mean score increased within the first 18 months of diagnosis and subsequently tended to plateau [33]. The current study was performed postoperatively, and patients may not have enough time to meaning searching and changed positively so that PTG levels may be lower.

This current study concluded that the anxiety scores of breast cancer patients are significantly different in ages. Anxiety levels of younger patients were significantly higher than those older patients. Younger breast cancer patients are faced with more unknown problems, such as fertility and marital crisis than older patients [34]. The fear of possible future events is the source of anxiety [35-36]. At the same time, the cognitive development of young breast cancer patients is still unstable and vulnerable to external influences [37-38]. So they are more prone to posttraumatic cognitive changes caused by the disease than older patients, thereby helping them to generate more PTG [39-41]. Negative psychological health status, including anxiety, depression, and PTSD were all significantly associated with social stimulations. What's more, Post hoc tests found that the influence of changes in Family members' health was significantly higher than other stimulations. This result reflected the characteristics of breast cancer patients themselves and indicated that the diagnosed with breast cancer is a deep damage to the individual's mental health.

The above conclusions enlighten that clinical staff need to provide different nursing plans for patients in different ages. For example, young breast cancer patients may need more proposals to release anxiety; older breast cancer patients may need more attention to their traumatic recovery. However, several design and measurement limitations must be acknowledged. This study is a cross-sectional study design and cannot clearly depict the trends of mental health in before-surgery after-surgery, chemotherapy, and recovery stage. Follow-up studies should focus on trajectories of mental health during long-term treatment, which based on a combination of longitudinal and cross-sectional studies. This study used only quantitative methods and did not describe the patient's mental health from an individual perspective. Future studies can be either qualitative or mixed studies [42]. What's more, the overall level and incidence are naturally different due to different research tools were used. China does not have a unified normative norm at present. Future researchers can use more advanced research methods which considered medicine [42-43] to refine the research process, to fully investigate the symptoms of breast cancer in China and more realistically and specifically understand the status of breast cancer patients.

Conclusion

The current study investigated the mental health status of breast cancer patients. In addition, we explored the influence of factors such as age and social stimulations on their mental health states. Results suggest that 13.53% breast cancer patients had anxiety; 21.5% had depression; the prevalence of PTSD was 7.15%, while the prevalence of PTG was 26.12%. What's more, the results suggested that anxiety scores and PTG level were significantly different in ages. Thus the medical staff shall provide differential nursing plans for differential age patients.

Acknowledgments

We gratefully thank the researchers of the Center of Trauma and Mindfulness Research and clinical

staff at the Galactophore Dept, Jiangsu Province Hospital for their assistance and support.

Conflicts of interest

Declaration of interest: None of the authors has any conflicts of interest to declare.

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