Original Article

Long-term fatigue state in postoperative patients with breast cancer

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Objective: To investigate the prevalence of long-term fatigue, anxiety, depression and social support, and the relationships among these symptoms in postoperative patients with breast cancer.

Methods: A total of 180 postoperative patients with breast cancer meeting criterion were recruited in this cross-sectional study. The Brief Fatigue Inventory (BFI), Hospital Anxiety and Depression Scale (HADS) and The Social Support Survey-Chinese version were used to assessing the fatigue, anxiety and depression, Social support of participants. The magnitude of the relationship among the symptoms of fatigue and other variables was measured by Spearman Rho correlation.

Results: The prevalence of long-term fatigue was 52.7%, and 18.3% occurred moderate/severe fatigue. Two-thirds of patients had a basal social support, only 12.8% of patients had better-perceived social support. Results of HADS showed that 16.7% and 21.1% of the participants have anxiety or depression disorder. Moderate/severe fatigue was negatively correlated with social support (r=–0.158, P=0.038) and positively correlated with age (r=0.132, P=0.042), chemotherapy (r=0.297, P=0.027), anxiety (r=0.324, P=0.018) and depression (r=0.211, P=0.034).

Conclusions: Long-term fatigue was highly prevalent among over half of postoperative patients with breast cancer, and moderate/severe fatigue was associated with social and psychological factors such as social support, anxiety and depression. Our results suggest that overall nursing care may be a more effective manner in improving fatigue and quality of life.

Keywords: Long-term fatigue; postsurgery; breast cancer

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Introduction

Breast cancer is one of the most common malignant cancers worldwide, and is currently the most common cancer and the third leading cause of cancer death in the female population in China (1). With the advanced development of cancer treatment, the survival rate and lifespan of breast cancer patients are significantly improved. However, unavoidable damage often occurs when patients receive cancer therapy, leading to side effects or symptoms occurring during or after treatment.

Fatigue, which is a nonspecific, multidimensional condition that includes psychological, social, and physiological aspects, is increasingly recognized as the most common and frequently side effect in breast cancer patients and survivors during their treatment (surgery, radiation and/or chemotherapy) (2). Previous studies have found that up to 99% breast cancer patients experienced some level of fatigue during the course of radiation therapy and/or chemotherapy, and more than 60% rate of fatigue are moderate to severe (3). Studies have also shown that the intensity and duration of fatigue experienced by breast cancer patients undergoing treatment is significantly greater than that experienced by healthy controls. Moreover, fatigue was considered to be the most distressing side effect of treatment in a group of breast cancer patients receiving adjuvant chemotherapy (4). Fatigue is a common symptom of depression and was reported to be associated with anxiety, depression and social support (5,6). Therefore, examining the prevalence, severity, and association of fatigue with

other health outcomes is important for understanding quality of life among breast cancer survivors. However, most studies have only focused on a single symptom and few studies examined interactions between fatigue, and psychological disorders together. To our knowledge, only a few studies to date have examined long-term fatigue (>1 year after operation) in breast cancer survivors (7,8), especially in postoperative patients. Therefore, examining the prevalence, severity and association of fatigue with other health outcomes is important for understanding the quality of life among breast cancer survivors.

The current study was designed to examine the prevalence of long-term fatigue, anxiety, depression and social support, and the relationships among these symptoms in postoperative patients with breast cancer. Our findings demonstrated that long-term fatigue was highly prevalent among over half of postoperative patients with breast cancer, and moderate/severe fatigue was associated with social and psychological factors such as social support, anxiety and depression. Our results suggest that overall nursing care may be a more effective manner in improving fatigue and quality of life.

Materials and methods

Study samples and recruitment

Breast cancer patients who treated in our hospital between June, 2010 and June, 2012 were recruited in this cross-sectional study. Inclusion Criteria were: (I) patients with a new diagnosis of breast cancer according to pathology diagnosis, patients who could read, write and were more than 18 years old; (II) patients with radical surgery and the pathological section was negative; (III) no obvious mental abnormalities , psychological disorder and cognitive impairment; (IV) patients were willing involve in this study. Exclusion Criteria were: (I) recurrence of breast cancer; (II) combination of other tumor or sever chronic illness, such as chronic obstructive pulmonary disease, coronary heart disease, diabetes. The study was approved by the Institutional Review Board of our hospital.

Measures

Study participants completed the standardized questionnaires assessing demographic factors and medical data, fatigue, social support, anxiety and depression. The current study focuses on the following measures.

Demographic factors and medical data

Information regarding demographic factors, including marital status, education, family economic level and occupation; and general medical data, including age, surgical method, differentiation of pathology and chemotherapy and radiotherapy post-surgery were obtained by Self-design Scale at the initial assessment and updated at follow-up.

Fatigue

The Brief Fatigue Inventory (BFI) (9) was used to measure the level of fatigue. The BFI is a widely used and well-validated nine-item self-report instrument for measuring clinically relevant fatigue. The BFI evaluates fatigue right now and during the past two weeks, and the severity and interference of fatigue with daily functioning during the past two weeks. It has been used extensively with several cancer patient populations and evidenced good internal reliability in the current sample. A score of 0 indicates no fatigue, 1-3 is considered mild, 4-6 is moderate, and 7-10 is severe fatigue.

Anxiety and depression

The Hospital Anxiety and Depression Scale (HADS) was used to measure levels of anxiety and depression (10). The scale consists of 14 items and two subscales (anxiety and depression) with seven items in each subscale. A score of 8 or above on either the anxiety or depression subscale is indicative of clinically relevant symptoms.

Social support

The Social Support Survey-Chinese version was used to examine social support of the participants (11). This survey consists of three dimensions (10 items): the subjective supports, objective supports and using degree of social supports. Each item is rated on a five-point rating scale of 1 (none of the time) to 5 (all of the time) to indicate how often the respondent received the support. These subscales and total scores were rescaled to a 0-50 scale. A higher score indicated better social support.

Data statistics

Statistical analysis was performed with SPSS 16.0 for Windows (SPSS, Chicago, IL, USA).

Quantitative data were shown as Mean ± SD. Qualitative

Table 1 The demographic and clinical characteristics of sample (n=180)

Characteristic	$\bar{x}$±SD or n (%)
Age (years)	53.8±15.2
Educational level	
Primary school (grades 1-6)	79 (43.9)
Secondary (grades 7-12)	65 (36.1)
University	36 (20.0)
Marital status	
Married	165 (91.7)
Single, divorced or widowed	15 (8.3)
Monthly household income (RMB/month)	
<4,000	62 (34.4)
4,000-8,000	79 (43.9)
>8,000	39 (21.7)
Occupation	
Intellectual work	69 (38.3)
Manual work	76 (42.2)
Not employed	35 (19.4)
Type of surgery	
Radical surgery	153 (85.0)
Breast conserving surgery	27 (15.0)
Stage of cancer	
I	33 (18.3)
II	122 (67.8)
III	25 (13.9)
Radiotherapy	
Yes	53 (29.4)
No	127 (70.6)
Chemotherapy	
Yes	125 (69.4)
No	55 (30.6)

data were shown as percentage or absolute value. Spearman Rho correlation was used to measure the magnitude of the relationship among the symptoms of fatigue and other variables. All tests were 2-tailed and P-value less than 0.05 were considered statistically significant.

Result

Characteristics of participants

A total of 264 patients with breast cancer were recruited.

Table 2 Prevalence and severity of fatigue, social support and psychological status

Symptom	n	%
Fatigue		
None	85	47.3
Mild	62	34.4
Moderate to severe	33	18.3
Social support		
Low	36	20.0
Basal	121	67.2
High	23	12.8
Psychological status		
Depression	30	16.7
Anxiety	38	21.1

Of these, 84 did not meet eligibility criteria. The reasons for exclusion were combination of other diseases (n=35), recurrence of breast cancer (n=15) and death (n=6); 28 did not participate in the survey due to unable to be contacted (n=16) and passive refusal (n=12). Eventually, 180 breast cancer patients participated in the study, a response rate of 68.2%. The mean interval time between surgery and survey was (2.1±0.8) years. The demographic and clinical characteristics of the participants are shown in *Table 1*. All the participates were female. The mean age was (53.8±15.2) years (range, 25 to 77 years) and most of the patients were married (91.7%). The educational level in our study samples was relatively low (43.9% were primary school level). Approximately two thirds of study samples (65.6%) had a monthly household income of more than 4,000 RMB. Almost one half of women (42.2%) were engaged in manual work and 19.4% were unemployed before the cancer was diagnosed. The majority of women were treated with radical surgery, followed by 29.4% of samples received radiotherapy and 69.4% with chemotherapy after surgery. Approximately two thirds of participates had been diagnosed with Stage II breast cancer. Details were listed in *Table 1*.

Prevalence and severity of fatigue, social support and psychological status

As shown in *Table 2*, the BFI score exhibited that the majority (52.7%) of participants (95 of 180) reported some level of fatigue: 34.4% (n=62) had mild fatigue (BFI =1-3), and 18.3% (n=33) had moderate or severe fatigue (BFI ≥4).

Table 3 Correlations between moderate/severe fatigue and selected variables

Characteristic	r[a]	P-value
Age	0.132	0.042
Educational level	0.118	0.145
Marital status	0.123	0.136
Monthly household income	–0.076	0.359
Occupation	0.082	0.334
Type of surgery	–0.069	0.367
Stage of cancer	0.094	0.211
Radiotherapy	0.105	0.113
Chemotherapy	0.297	0.027
Social support	–0.158	0.038
Depression	0.211	0.034
Anxiety	0.324	0.018

[a], for continuous variables,r was calculated as point biserial correlation; for categorical variables, r was calculated as phi coefficient.

The results of Social Support Survey showed that two-thirds of patients had a basal social support, only 12.8% of patients had better-perceived social support. Results of HADS showed that 16.7% and 21.1% of the participants had anxiety or depression disorder.

Correlations of moderate/severe fatigue

In addition to evaluating the prevalence of fatigue in this study, we also examined the correlations between moderate/severe fatigue and other factors. As shown in *Table 3*, variables that were significantly positively correlated with moderate/severe fatigue were age (r=0.132, P=0.042), chemotherapy (r=0.297, P=0.027), depression(r=0.211, P=0.034) and anxiety (r=0.324, P=0.018). Whereas Social support (r=–0.158, P=0.038) and moderate/severe fatigue appeared in an obvious inversely correlation.

Discussion

This study evaluated the prevalence and severity of long-term fatigue in a relatively large sample of breast cancer patients after operation using a well-validated fatigue scale (BFI). Our results demonstrated that over one-half of participants had some level of fatigue, which was consistent with previous studies showing fatigue was highly prevalent among cancer survivors (12), and fatigue may persist for months or years after breast cancer resection despite no evidence of active cancer. To our knowledge, the current study is the first study of fatigue symptoms in long term postoperative breast carcinoma survivors.

In the current study, we also performed the Social Support Survey to examine social support of the participants. The social environment may represent a protective shield to patients from the harmful effects of anxiety associated with cancer (13). It has been found that social support plays an important role in reducing the pressure and improving health. Cancer patients who lack social support may be more pessimistic and desperate as they are constantly looking for support from others (14). The results of this study showed that the majority of patients have a basal social support which was in accordance with normal persons. Because the survey samples in this study were breast carcinoma survivors after operation for more than one years, thus the effect of disease and therapy on the patients may be attenuated. The current study results also provided information regarding the prevalence of anxiety and depression in postoperative breast carcinoma survivors, 16.7% had anxiety and 21.1% might have been at risk for depression even one year after tumor resection, indicating that breast cancer and its related treatment may have had greater negative effects on the psychological well-being of the participants.

These results also demonstrate the association between moderate/severe fatigue and demographic, psychological factors. The significant associations of fatigue included both demographic factors and psychological symptoms. Of these, social support was inversely correlated with moderate/severe fatigue, the findings were consistent with previous studies claiming that elevate social support may ameliorate the severity of fatigue in breast cancer patients (15). Age and chemotherapy were positively associated with fatigue, this is in agreement with many previous studies that women who received chemotherapy reported more severe fatigue than those who did not (3,16). Fatigue also was significantly correlated with depression and anxiety, Fatigue is known to co-occur with depression in cancer patients and survivors (17). The current results indicate that women who experience anxiety and depressive symptoms after diagnosis are at increased risk for long term fatigue. The results of the current study confirm the close links between fatigue and psychological status and highlight the importance of carefully assessing the psychological status in breast cancer survivors who report problems with fatigue. Overall, Fatigue in postoperative

breast cancer patients is a ubiquitous symptom that correlates with a cluster of other symptoms. A targeted and systematic approach to the treatment of fatigue is needed for cancer patients with fatigue.

Strengths of this study included a relatively large sample size and this was the first study to evaluate the prevalence and severity of fatigue in breast cancer survivors one to three years post-breast cancer surgery. However, there were several limitations in our study. First, 28 of samples did not participate in the survey and 12 of them were due to passive refusal, so the incidence of fatigue may be underestimated. Second, this study is a cross-sectional design, which makes it difficult to identify cause and only provides information about the symptom levels of the participants at only one point in time.

In conclusion, the findings of the current study demonstrate that long-term fatigue is highly prevalent among over half of postoperative patients with breast cancer, and moderate/severe fatigue is associated with social and psychological factors such as social support, anxiety and depression. Our results suggest that overall nursing care may be a more effective manner in improving fatigue and quality of life of postoperative patients with breast cancer.

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