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Original Article

Quality of life among women with breast cancer living in Wuhan, China

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ABSTRACT

Background: Quality of life is an important indicator in patients with breast cancer. Studies here reported that the quality of life in patients with breast cancer is low and many factors contribute to this poor quality of life.

Purpose: To examine the relationships among demographic characteristics, optimism, social support, illness related factors, appraisal of illness, coping strategies and the quality of life of Chinese women with breast cancer residing in Wuhan, China.

Methods: A convenience sample of 156 Chinese women with breast cancer was recruited from five teaching hospitals in Wuhan, China. Participants completed the Revised Life Orientation Test, the Perceived Social Support Scale, the Symptom Distress Scale, the Appraisal of Illness Scale, the Medical Coping Modes Questionnaire, and the Functional Assessment of Cancer Therapy-Breast. Path analysis was used to examine factors influencing quality of life.

Results: Significant relationships were found between optimism, symptom distress, social support, appraisal of illness, a give-in coping mode and quality of life. Optimism, social support, symptom distress, lymph node status, appraisal of illness, and a give-in coping mode accounted for 66.6% of the variance in quality of life.

Conclusions: The findings of this study underscore the importance of helping women reduce symptoms distress, appraise their illness positively, use less negative coping modes, and maintain optimism, maintain good social support, because all of these factors indirectly or directly affect their quality of life.

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1. Introduction

Breast cancer is one of the most common malignant tumors in women, and the incidence is increasing worldwide. In China, about 400,000 women die of breast cancer yearly and the incidence has reached to about 40/100,000 recently compared to 27/100,000 in the seventies of 20th century [1]. Breast cancer is one of the most prevalent cancers and the leading cause of death among women in major metropolitan areas in China [1,2]. The incidence of breast cancer has increased by over 51% in the past 25 years in major cities such as Beijing, Shanghai and Guangzhou [1,2]. In Wuhan, central China, breast cancer ranks second among malignant tumors in women [3].

The world health report 2007 (WHO) reported that Chinese women's average life expectancy is 74 years. Although it is not known the average life expectancy of Chinese women with breast cancer, the median age of women diagnosed with breast cancer in China is 48 years, nearly 10 years younger than among women in Western countries [4]. In China, patients with breast cancer receive surgery and/or adjuvant therapies including chemotherapy, radiotherapy, and hormone therapy. In addition to traditional biological indices, in recent years, quality of life has been used to evaluate the effects of cancers. Quality of life includes social functioning, psychological functioning, and physical functioning [5].

Many studies have found that the quality of life (QOL) of patients with breast cancer is low [6,7]. Researchers have also identified factors related to quality of life in these patients, including marital status, income, age and educational status [3,8]. In China, prior studies have examined relationships between QOL and symptoms, social support, and coping methods [6]. However, the relationships of personal optimism and appraisal factors with quality of life have not been examined in women with breast cancer in China. Therefore, this study examined effects of demographic, medical and other psychosocial factors, appraisal of illness, and coping strategies on the quality of life of women with breast cancer living in Wuhan, China.

2. Background

A cognitive appraisal model of stress and coping guided the study [9]. According to the stress and coping theory, outcomes in response to a stressor (e.g., being diagnosed with breast cancer) are influenced by the attributes of the individual (e.g., personality traits, demographics), the individual's cognitive appraisal of the situation, and the coping strategies the individual uses to manage the situation [9].

2.1. Quality of life

Quality of life has been defined as a multidimensional concept encompassing the individual's physical well-being, social/family well-being, emotional well-being, functional well-being and concerns about breast cancer. Zhao and Li found that patients with breast cancer had lower scores in the physical, mental, and social areas [7]. A number of factors influencing the QOL in women with breast cancer have been

identified as personal factors [8], optimism [10], social support [11], symptom distress [12], medical characteristics [13], appraisal of illness [14], and coping strategies [7].

2.2. Demographics and optimism

Personal factors include demographic characteristics and optimism. Age has been considered as the important factor where younger women have been reported to have greater emotional distress than older women during the first year after diagnosis and during the survivor phase of the disease [7,15,16]. In China, studies also showed that younger women had a lower quality of life [8]. Education also has been related to adjustment. In western countries, women having less education reported more adjustment difficulties than women with higher levels of education [17]. However, the situation is opposite in China. The more education women had, the lower quality of life they perceived [7]. Patients with higher income scored higher scores on a QOL scale than that of those with lower incomes. Women who were married had higher scores on a QOL scale than that of those who were unmarried or divorced or whose husbands had died [7].

Optimism has been defined as the general expectancy that one will have a positive future [18]. Optimism is important in how individuals face difficulty, such as specific health threats for example, the diagnosis of breast cancer [19]. Optimism is a protective factor that is associated with resilience under stress. Optimism has been associated with a number of positive health benefits for healthy individuals as well as cancer patients, including enhanced well-being [20], decreased distress [21], and decreased anxiety and depression [22]. Prior research has also found that optimism was also associated with better QOL in people with breast cancer [23]. However, this relationship has not yet to be fully examined in Chinese women with breast cancer.

2.3. Social support

Social support has been defined as resources obtained from others or a social network, which can help an individual to cope with the problems and/or a crisis [24]. Social support has also been linked to the quality of life in patients with breast cancer. Higher levels of social support have been associated with better adjustment to breast cancer [11]. In China, studies have found that social support is one of the most important factors that influence the quality of life in patients with breast cancer [25,26]. Zhang et al. reported that patients with breast cancer received less social support [27]. However Li and her colleagues found that women with breast cancer received more social support than healthy people [28]. Zhao and Li found that social support positively associated with quality of life [7].

2.4. Symptom distress

Symptom distress was defined as "the degree of discomfort from the specific symptom being experienced as reported by the patient" [29]. Symptom distress has been associated to the quality of life in individuals with cancer [12]. Chinese women with breast cancer had low levels of psychological health and well-being and these symptoms were correlated with the QOL of women with breast cancer [6].

2.5. Medical characteristics

Medical characteristics include type of surgery, lymph node status, time since diagnosis, current treatment, recurrence status, and other health problems associated with the illness. In China, research studies on the type of surgery and its effect on the QOL had different results. The study of Yan et al. showed that there were no significant differences in functions and symptoms except for body image differences between patients who underwent breast-conserving surgery or modified radical mastectomy [30]. However, in the study of Yu et al., they found a difference in the QOL between patients who underwent breast-conserving surgery or modified radical mastectomy on physical well-being, emotional well-being, functional well-being and additional concerns about breast cancer [31]. Northouse found that women with breast cancer metastasized to lymph nodes perceived poorer quality of life than women without cancer in their lymph nodes [23]. Likewise, women whose cancer recurred reported a lower quality of life than that of women whose cancer did not recur. Berglund et al. reported that the QOL in patients undergoing chemotherapy was higher than that of those who underwent postoperative radiotherapy [32].

2.6. Appraisal of illness

Appraisal of illness is the individual's subjective evaluation of the meaning of the illness. Stressful appraisals involve beliefs that an illness is associated with potential harm, loss, or threat. Previous studies have found that stressful appraisals partially mediate the effect of symptom distress [33] and family hardiness [34] on mood. Few studies have been conducted in Chinese women with breast cancer regarding their appraisal of illness and the relationships between the antecedent variables and quality of life.

2.7. Coping strategies

Lazarus and Folkman have recognized that coping strategies fall into two main groups: (1) problem focused coping which focus on managing or altering the problem and (2) emotional focused coping which focuses on regulating the emotional

response to the problem [9]. Lu found that 83.8% of patients with breast cancer preferred to adopt problem-focused coping strategies and 16.2% chose to relieve their psychological stress by using emotion-focused coping strategies [35]. Zhao and Li reported that coping method had a positive correlation with the physiological and mental components of their QOL [7].

In summary, some research has already explored the relationships among demographics, optimism, social support, symptom distress, medical characteristics, coping strategies and quality of life [6,7,11,21,23,26]. But the relationships among demographics (education) [8,17], medical characteristics (type of surgery) [30,31] are also not consistent. Further, little is known about the relationships among optimism, appraisal of illness and QOL in Chinese women with breast cancer using a cognitive appraisal model of stress and coping.

Based on the conceptual framework and previous studies, it was hypothesized that antecedent factors, women's personal characteristics, social resources, and illness-related factors would influence the way women appraised their illness. In turn, these factors would affect their coping strategies. Furthermore, it was hypothesized that appraisal of illness and coping strategies would have a direct effect on quality of life and also mediate the relationship between antecedent factors and quality of life (Fig. 1).

3. The study

3.1. Aim

The aim of this study was to examine the relationships among demographic characteristics, optimism, social support, illness related factors, appraisal of illness, coping strategies and the quality of life of Chinese women with breast cancer residing in Wuhan, China.

3.2. Design

A descriptive and correlation quantitative study design was adopted, six questionnaires were used to collect data.

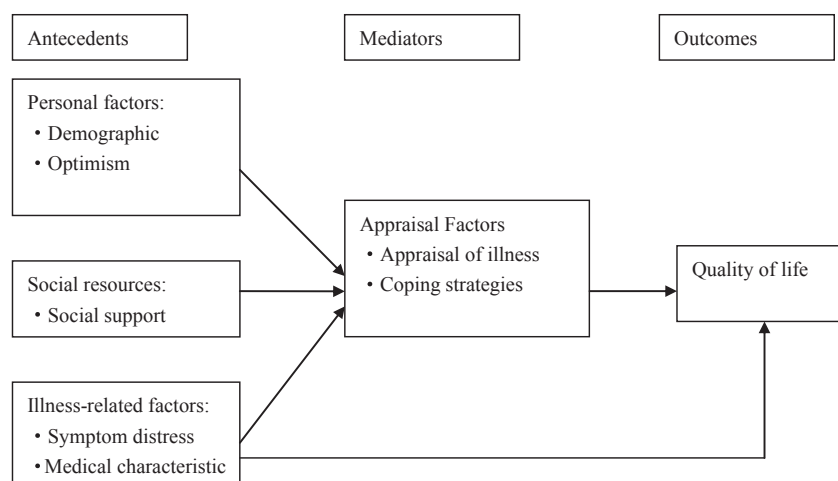


Fig. 1 – Conceptual framework of quality of life among Chinese women with breast cancer.

Table 1 – Characteristics of the study participants.

Characteristic	N	Mean ± SD or N (%)	(Min, max)
Age	156	47.7 ± 10.3	(23, 76)
Marital status	155		
Married		143 (92.3%)	
Divorced/widowed		10 (6.5%)	
Single		2 (1.3%)	
Monthly income	154		
<\$90		23 (14.9%)	
\$90–\$160		32 (20.8%)	
\$160–\$310		48 (31.2%)	
>\$310		51 (33.1%)	
Education	156		
Elementary		66 (42.3%)	
High school		53 (34.0%)	
Bachelor's degree		37 (23.7%)	
Insurance status	156		
Self payment		44 (28.2%)	
Insurance partial payment		112 (71.8%)	
Type of surgery	151		
Total mastectomy		13 (8.6%)	
Modified radical mastectomy		131 (86.8%)	
Lumpectomy and axillary dissection		7 (4.6%)	
Lymph node (LN) status	152		
Spread to adjacent LN		58 (38.2%)	
Has not spread		94 (61.8%)	
Treatment at study entry ^a	155		
Chemotherapy		20 (12.9%)	
Radiation therapy		104 (67.1%)	
Hormone therapy		1 (0.6%)	
No treatment		9 (5.8%)	
Other treatment		6 (3.9%)	
Chemo & radiation therapy		10 (6.5%)	
Radiation & hormone therapy		4 (2.6%)	
Chemo& radiation & hormone therapy		1 (0.6%)	
Prior treatment	145		
Chemotherapy		2 (1.4%)	
Radiation therapy		78 (53.8%)	
No treatment		46 (31.7%)	
Other treatment		2 (1.4%)	
Chemo & radiation therapy		9 (6.2%)	
Radiation & hormone therapy		1 (0.7%)	
Chemo& radiation & hormone therapy		7 (4.8%)	
Recurrence status	156	8 (5.1%)	

^a Can have more than one type of treatment.

3.3. Participants

Participants were recruited from five teaching hospitals with Tertiary A level hospitals in Wuhan, Hubei province. All female patients with breast cancer who were currently receiving treatment in the five hospitals were invited to participate in the study and the purpose of the study was explained. Selection criteria included treatment in one of the five hospitals; at least 1 month post confirmed diagnosis of breast cancer, and without any other known chronic disease. Patients with breast cancer who met the criteria and also showed willingness to participate in the study received a letter about the study and a packet of questionnaires to complete. Questionnaires were returned completed to the first author. A total convenience sample of 180 women with breast cancer was contacted from the five hospitals and 156 (86.7%) agreed

to participate in the study. A minimum sample size of 122 was needed to provide 80% of power at the alpha = 0.05 level, with 11 variables to detect a R^2 of 0.15. The study was approved by the university and the hospitals, and all participants gave informed consent.

3.4. Data collection

Patients with breast cancer who met the criteria and also showed willingness to participate in the study received a letter about the study and a packet of questionnaires to complete. Questionnaires were returned completed to the first author. A total convenience sample of 180 women with breast cancer was contacted from the five hospitals and 156 (86.7%) agreed to participate in the study. A minimum sample size of 122 was needed to provide 80% of power at the alpha = 0.05 level, with

Table 2 – Scores on quality of life and other study variables (n = 156).

	Minimum	Maximum	Mean	SD
Optimism	11.00	29.00	20.72	3.36
Total social support	28.00	84.00	70.13	8.52
Symptom Distress	0.00	33.00	12.35	7.01
Appraisal of illness	1.07	4.48	2.62	0.80
Affront coping mode	9.00	31.00	18.95	4.22
Give-in coping mode	5.00	19.00	8.83	3.10
Physical-QOL	0.00	28.00	17.70	5.68
Social-QOL	0.00	28.00	22.96	4.24
Emotional-QOL	1.00	24.00	17.98	4.64
Functional-QOL	1.00	28.00	14.13	5.79
Additional items-QOL	5.00	33.43	22.72	6.19
Total QOL	41.75	134.08	95.48	18.19

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3.5. Ethical considerations

The study was approved by the university and the hospitals, and all participants gave informed consent.

3.6. Data analysis

Descriptive statistics such as frequencies, percentages, means, and standard deviations (SD) were calculated for sample description. Reliability of instruments via internal consistency was calculated using Cronbach's alpha. Bivariate analyses were performed by estimating pairwise Pearson or Spearman correlations and their tests of significance. Multivariate modeling was performed using path analysis in AMOS v19.0 (AMOS Development Corp., Meadville, PA) and in Mplus v6.12 [37]. Both direct and indirect effects of hypothesized antecedent variables and direct effects of potential mediators on quality of life scores were examined. Study variables with low prevalence, low correlations in magnitude or not statistically significant in bivariate analyses were excluded from the modeling. Four participants with missing data on their lymph node status were excluded from the path modeling (2.6%).

Standardized (β) and unstandardized estimates are reported. A two-sided p -value < 0.05 was considered statistically significant.

4. Findings

Non-responder characteristics were not collected with the rationale for refusal as “not interested” or “too busy”. Of the 180 eligible women, 156 (86.7%) agreed to participate in the study. Characteristics of the study participants are showed in Table 1. The average age of participants was 48 ± 10.3 years, with a range from 23 to 76 years. Almost half of the women (42.3%) had a middle school education or less; 34% had a high school education; and 23.7% had a bachelor's degree or the equivalent. Almost all the women (92.3%) were married and living with their husbands; 6.5% were divorced or widowed; and two persons were single. The great majority (85.1%) of the women had family incomes per person of more than 518 Yuan per month, which is above the lowest wage level in Wuhan; 14.9% of the women's family incomes were below that level [38]. Most of the women (71.8%) had medical insurance, but 28.2% paid medical costs themselves.

Over half of the women (61.8%) reported that their breast cancer had not spread to adjacent lymph nodes or other parts of the body. When they entered the study, the women were receiving chemotherapy (76.8%), radiation therapy (20%), hormone therapy (0.6%), other therapy, or no treatment (5.8%). Over half (65.5%) had received chemotherapy before; 12.4% had received radiation therapy before; and 31.7% had not had any therapy. Nearly all the women had surgeries. Eighty-six percent had received a modified radical mastectomy; 8.6% received a total mastectomy; and 4.6% received a lumpectomy and axillary dissection. Nearly all had the operation on one side of the breast (left side: 49%, right side: 47.7%); only 2.6% had received the operation on both sides. Few of the women (5%) reported recurrence.

4.1. Quality of life and other study variables

Table 2 presents the scores on quality of life and other study variables. On average, the women in the study reported

Table 3 – Correlations among study variables (n = 156).

	1	2	3	4	5	6	7	8	9	10	11	12
1.Age	–											
2.Education level	–0.12											
3.Income	0.05	0.39**										
4.Insurance	0.32**	0.23**	0.13									
5.Lymph node status	0.03	–0.00	–0.12	–0.01								
6.Optimism	0.17*	0.01	0.13	0.03	–0.11							
7.Symptom distress	0.04	0.08	0.05	0.06	0.07	–0.31**						
8.Social support	0.10	0.08	0.13	0.09	–0.03	0.39**	–0.24**					
9.Appraisal of illness	0.03	–0.13	–0.17*	–0.03	0.24**	–0.49**	0.44**	–0.33**				
10.Affront coping mode	–0.02	0.24**	0.09	0.03	0.03	0.18*	0.16*	0.19*	0.09			
11.Give-in coping mode	0.04	–0.19*	–0.10	–0.11	0.12	–0.43**	0.31**	–0.24**	0.63**	–0.17*		
12.QOL	0.06	0.03	–0.04	0.06	–0.19**	0.54**	–0.60**	0.41**	–0.62**	0.05	–0.54**	–

* $P < 0.01$ (2-tailed).

** $P < 0.05$ (2-tailed).

Table 4 – Direct and indirect effects from path analysis of appraisal of illness^a, Coping mode^b, and QOL^c (n = 152).

	Effect	Appraisal of illness (AIS)				Give-in coping mode (GICM)				QOL			
		St.	Unst.	SE	P	St.	Unst.	SE	P	St.	Unst.	SE	P
Optimism	Direct	-0.371	-0.089	0.017	<0.001	-0.419	-0.387	0.071	<0.001	0.200	1.090	0.336	0.001
	Indirect AIS	–				–				0.082	0.449	0.149	0.003
	Indirect GICM	–				–				0.081	0.441	0.150	0.003
	Total indirect	–				–				0.163	0.890	0.211	<0.001
Social support	Direct	-0.081	-0.008	0.006	0.229	-0.073	-0.026	0.026	0.325	0.116	0.245	0.107	0.022
	Indirect AIS	–				–				0.018	0.038	0.033	0.253
	Indirect GICM	–				–				0.014	0.030	0.031	0.344
	Total indirect	–				–				0.032	0.068	0.046	0.138
Symptom distress	Direct	0.302	0.034	0.008	<0.001	0.125	0.054	0.032	0.091	-0.387	-0.997	0.139	<0.001
	Indirect AIS	–				–				-0.067	-0.173	0.061	0.004
	Indirect GICM	–				–				-0.024	-0.062	0.041	0.128
	Total indirect	–				–				-0.091	-0.235	0.073	0.001
Lymph node status	Direct	-0.197	-0.322	0.103	0.002	-0.107	-0.672	0.435	0.122	0.098	3.620	1.816	0.046
	Indirect AIS	–				–				0.044	1.621	0.683	0.018
	Indirect GICM	–				–				0.021	0.766	0.542	0.158
	Total indirect	–				–				0.064	2.388	0.872	0.006
Appraisal of illness	Direct	–				–				-0.222	-5.041	1.370	<0.001
	Indirect	–				–				–			
Give-in coping mode	Direct	–				–				-0.193	-1.141	0.326	<0.001
	Indirect	–				–				–			

Abbreviations: St., Standardized; Unst., Unstandardized.

^a R² = 0.397 for appraisal of illness.^b R² = 0.277 for give-in coping mode.^c R² = 0.666 for QOL.

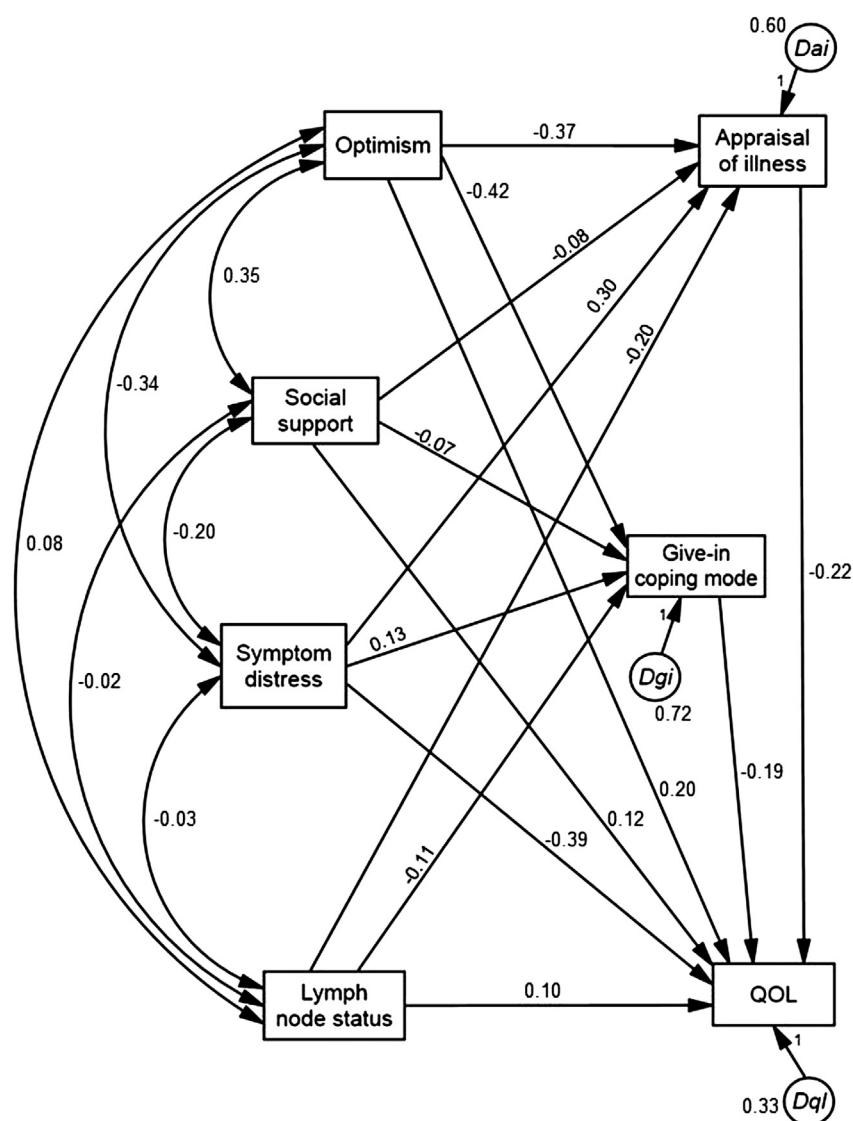


Fig. 2 – Path diagram of quality of life model, standardized estimates ($n = 152^*$).

moderate quality of life ($M = 95.5$, $SD = 18.2$). Their mean scores ($M = 20.7$, $SD = 3.4$) on the Revised Life Orientation Test (Chinese version) were higher than the mean score of a sample of 404 Hong Kong and 328 mainland Chinese college students [36] indicating that they tended to be optimistic. In general, the women reported fairly high perceived social support: mean scores on the PSSS (70.1, $SD = 8.5$) and its subscales were high, and mean score on family support (25.4, $SD = 2.6$) was the highest of the three subscales.

Symptom distress scores were fairly low to moderate on average. The most commonly reported symptoms were fatigue (76.9%), pain (76.3%), insomnia (75.6%), nausea-1 (71.8%), appetite (71.2%), and appearance (71%). Symptoms with the highest reported frequency and greatest intensity, as indicated by mean symptom severity ratings, were insomnia ($M = 1.32$, $SD = 1.16$), nausea-2 ($M = 1.27$, $SD = 1.26$), fatigue ($M = 1.23$, $SD = 1.01$), pain ($M = 1.22$, $SD = 1.08$) and appetite

problems ($M = 1.20$, $SD = 1.11$). The average total intensity score was $M = 12.35$, $SD = 7.01$, with a range from 0 to 33.

The estimated AIS means suggest that the women reported less stressful appraisals in this study (mean AIS = 2.62, $SD = 0.80$). Table 2 gives summary statistics for the measures reported in this study.

4.2. Factors related to quality of life

Table 3 presents the correlations among the study measures. Because almost all the women (92.3%) were married and living with their husbands, marital status was not included in the path analysis. For a similar reason, insurance was not included. None of the demographic variables examined (age, education level and income) had significant bivariate relationships with patients' quality-of-life scores. However, optimism was related to patients' appraisal of illness ($r = 0.49$,

$p < 0.01$), use of the giving-in coping mode ($r = -0.43, p < 0.01$) and quality of life ($r = 0.54, p < 0.01$).

Most women were receiving one or more treatments when they entered the study. Most also had received one or more treatments before they were recruited. Nearly all (86.8%) had received a modified radical mastectomy. Only 5% reported that their cancer had recurred. Therefore, the women's current treatment, previous treatment, type of surgery and recurrence were not included in the path analysis. Lymph node status as the medical variable was related to patients' appraisal of illness ($r = 0.24, p < 0.01$), but not to quality of life. Symptom distress was related to patients' appraisal of illness scores ($r = 0.44, p < 0.01$), giving-in coping mode scores ($r = 0.31, p < 0.01$) and quality-of-life scores ($r = 0.60, p < 0.01$).

Social support showed a relationship with patients' appraisal of illness scores ($r = -0.33, p < 0.01$), giving-in coping mode scores ($r = 0.24, p < 0.01$) and quality-of-life scores ($r = 0.41, p < 0.01$). Appraisal of illness was significantly related to patients' quality of life ($r = 0.62, p < 0.01$), as was giving-in coping mode ($r = 0.54, p < 0.01$).

The results from the path analysis are shown in Table 4, and the path diagram with standardized estimates is shown in Fig. 2. Antecedent variables accounted for 39.7% of the variance in appraisal of illness (AIS), with optimism ($\beta = -0.37, p < 0.01$), symptom distress ($\beta = 0.30, p < 0.01$), and lymph node status ($\beta = -0.20, p < 0.01$) are significantly associated with AIS scores. Also, antecedent variables explained 27.7% of the variance in giving-in coping mode (GICM) and optimism ($\beta = -0.42, p < 0.01$) was significantly related to these coping mode scores.

Antecedent and mediator variables accounted for 66.6% of the variance in quality of life scores in the path analysis. Optimism ($p < 0.01$), social support ($p = 0.02$), symptom distress ($p < 0.01$), appraisal of illness ($p < 0.01$), and give-in coping mode ($p < 0.01$) had significant direct effects on quality of life. Higher optimism scores ($\beta = 0.20$), higher social support scores ($\beta = 0.12$), lower symptom distress scores ($\beta = -0.39$), lower appraisal of illness scores ($\beta = -0.22$), and lower give-in coping mode scores ($\beta = -0.19$) were directly associated with higher quality of life scores.

Mediating effects of optimism ($p < 0.01$), symptom distress ($p < 0.01$), and lymph node status ($p = 0.01$) were found. Higher optimism scores were indirectly associated with higher quality of life scores, both through AIS ($p < 0.01$) and GICM ($p < 0.01$). Higher symptom distress scores were indirectly associated with lower quality of life scores through AIS ($p < 0.01$), but not through GICM ($p = 0.13$). Thus, appraisal of illness and giving-in coping mode appeared to serve as partial mediators between optimism, symptom distress, and quality of life. However, strong direct effects of optimism and symptom distress on quality of life remained, even in the presence of these mediation effects. Interestingly, social support did not have an indirect effect on quality of life, but did have a significant direct effect.

5. Discussion

Improving QOL is a pivotal concern for patients with breast cancer. On average, the women in this study reported better

quality of life than women in an earlier study by Gu and colleagues [39]. However, the women reported poorer quality of life than women with breast cancer in Shanghai [40], except for the social/family subscale. Participants' lower quality of life in Wuhan may be attributable to the fact that they were receiving chemotherapy with its many side effects when they entered the study, while the women in Shanghai had had a rest for at least 1 month after receiving chemotherapy before they participated in the QOL study.

No demographic variables contributed significantly to these women's QOL. This is consistent with a study by Huang et al. [41] which found no significant relationships between age, marital status, occupation, family income and QOL. In the study, insurance was not included as an independent predictor for appraisal of illness, coping strategies and QOL because the majority of participants had insurance (72%) and almost all were married (92%). Therefore, predictive ability of these characteristics of outcomes (e.g., QOL) would be less due to low prevalence of those self-paying or not married. Optimism was related to patients' appraisal of illness, giving-in coping mode and quality of life in this study, similar to the findings of Northouse and colleagues' study [23]. Lymph node status was related to quality of life and to patients' appraisal of illness. Symptom distress was related to patients' appraisal of illness, giving-in coping mode scores and quality of life and appraisal of illness was related to patients' quality of life. Therefore, nurses should assess women's mood status and provide health education to teach women to maintain a positive mood and optimism. Helping women to know changes of their lymph node status and manage their distress symptoms may improve their quality of life.

In the study, the average age of these women were 47.7 ± 10.3 years and the youngest woman was just 23 years old which is conform with the results about the median age of women diagnosed with breast cancer in China is 48 years, nearly 10 years younger than among women in Western countries [4]. Nurses should teach Chinese women about breast self-examination and prevention of breast cancer.

This study examined how personal factors, social resources, and illness-related factors predicted quality of life among women with breast cancer in Wuhan, China. As hypothesized, appraisal of illness and coping strategies had significant, direct effects on women's quality of life. Women who had more stressful appraised illness were associated with statistically significantly lower quality of life. Women who more negatively coped with the cancer using the giving-in coping mode also reported significantly lower quality of life.

Appraisal of illness and coping strategies mediated the relationships between lymph node status and quality of life, and they partially mediated the relationships between optimism, symptom distress and quality of life. However, optimism also had a direct effect on quality of life. Optimism has also been associated with adjustment to illness in prior reports, and specifically for patients with breast cancer [19].

Social support was significantly related to appraisal of illness, giving-in coping mode and quality of life. However, in the path analyses, social support was significantly independently associated with appraisal of illness or giving-in coping mode, probably because social support was moderately correlated with many other variables. Social support did have

a significant direct effect on quality of life. Higher satisfaction with an ability to help and support from one's family, friends and a significant other was associated with women's higher quality of life. Other investigators have also reported that social support helps women adjust to breast cancer [7].

Appraisal of illness and coping strategies are important for Chinese women with breast cancer. Therefore, nurses need to assist patients in understanding illness and teach women with breast cancer about effective coping skills. Nurses should work with family members to provide supports to patients, particularly when patients discharged home and community nurses should play important roles in assisting them to cope with symptom stress.

Given the study design was correlational, these findings should be interpreted with caution. Other limitations include possible measurement overlap between factors and dimensions of quality of life. For example, the factor of social support and its possible measurement overlap with the social–family dimension of quality of life. Further, this was a convenience sample, the majority of the participants were married and living with their husbands, and all received therapies at a Tertiary A level hospital. Hence, the results may not be generalizable to more socioeconomically diverse Chinese women with breast cancer. Further, development of study measures was performed in the West and some (SDS and AIS) and it has not been validated for use with a Chinese mainland population.

6. Implications for nursing practice

Our findings also emphasize the importance of examining how women appraise and cope with their illness, so that helping women with more stressful assessment and negative coping modes is paramount. Even though the study participants did not have high symptom distress, they did have considerable distress in areas such as insomnia, nausea, fatigue, and pain. Decreasing this distress is important to improve patients' quality of life. Further, intervention programs for women with breast cancer should emphasize effective ways to make women remain optimistic, reduce symptom distress, gain support from family, friends and others and use effective coping strategies. Future research may include women with breast cancer who are divorced, widowed or single to explore the effect of marital status on quality of life. Future researches on interventions to increase coping strategies and provide family support are imperative in improving quality of life of Chinese women with breast cancer.

7. Conclusion

Optimism, social support, symptom distress, lymph node status, appraisal of illness and give-in coping mode had direct effects on quality of life in this sample. Thus, future research should test interventions to assist Chinese women to increase their personal optimism, maintain their social support, reduce symptom distress and enhance coping strategies, so that these women with breast cancer can afford a better quality of life.

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