

Factors associated with quality of life of breast cancer patients

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- Background** : *To improve the quality of life (QOL) of breast cancer patients is an important issue for nursing staff. Therefore, understanding the associated factors with QOL is a crucial knowledge for developing nursing intervention.*
- Objective** : *To examine the associated factors with QOL and the effected factors_on the QOL of breast cancer patients.*
- Design** : *A cross-sectional descriptive design.*
- Patients** : *One hundred and fifty female patients with breast cancer receiving chemotherapy.*
- Material and Method** : *The participants were asked to respond to a set of seven questionnaires: The Personal Data Form, Piper Fatigue Scale, Pain Scale, Depression Scale, Insomnia Scale, Social Support Questionnaire, and Quality of Life Index.*
- Results** : *The mean scores of the QOL (\bar{X} = 66.43; SD = 13.94) was at a moderate level. All independent variables including fatigue, pain, depression and sleep disturbance were significantly negatively correlated with QOL accept social support that had a significantly*

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positive associated with QOL. Significant factors effected on the QOL were depression, fatigue and the stage of cancer ($\beta = -.56; -.31; \text{ and } -.15, \text{ respectively; } P < .01$). Three variables accounted for 71% of the variance ($P < .01$).

Conclusions : *The findings indicate that the Symptom Management Model is a useful guideline for explaining the QOL of breast cancer patients undergoing chemotherapy. When designing effective nursing interventions, nurses should emphasize ways of helping breast cancer patients to manage or control the severity of depression and fatigue symptoms.*

Keywords : *Quality of Life, breast cancer patients, fatigue, depression, stage of cancer.*

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- เหตุผลของการทำวิจัย** : การพัฒนาคุณภาพชีวิตของผู้ป่วยเต้านมเป็นประเด็นที่สำคัญสำหรับพยาบาล ดังนั้นการเข้าใจปัจจัยที่สัมพันธ์กับคุณภาพชีวิตจึงเป็นความรู้ที่สำคัญในการพัฒนาโปรแกรมทางการพยาบาล
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- ผลการศึกษา** : คะแนนเฉลี่ยของคุณภาพชีวิตอยู่ในระดับปานกลาง ($\bar{X} = 66.43$; $SD = 13.94$) และพบว่าปัจจัยต้นทุกตัว ได้แก่ อาการเหนื่อยล้า ความเจ็บปวด ภาวะซึมเศร้า และอาการนอนไม่หลับ มีความสัมพันธ์ทางลบกับคุณภาพชีวิต ยกเว้นการสนับสนุนทางครอบครัวมีความสัมพันธ์ทางบวกกับคุณภาพชีวิต และปัจจัยที่มีผลต่อคุณภาพชีวิตในการศึกษาครั้งนี้ ได้แก่ ภาวะซึมเศร้า ความเหนื่อยล้า และระยะของโรค ($\beta = -.56$; $-.31$; และ $-.15$ ตามลำดับ; $P < .01$) โดยปัจจัยทั้งสามสามารถอธิบายความแปรปรวนของคุณภาพชีวิตได้ร้อยละ 71 ($P < .01$)
- สรุป** : ผลการวิจัยชี้ให้เห็นว่า แบบจำลองการจัดการกับอาการสามารถนำมาใช้ในการอธิบายคุณภาพชีวิตของผู้ป่วยมะเร็งเต้านมที่ได้รับเคมีบำบัดได้ ทั้งนี้ควรศึกษาการออกแบบโปรแกรมทางการพยาบาล โดยเน้นการช่วยเหลือผู้ป่วยในการจัดการหรือควบคุมความรุนแรงของภาวะซึมเศร้า และ ความเหนื่อยล้า
- คำสำคัญ** : คุณภาพชีวิต, ผู้ป่วยมะเร็งเต้านม, ความเหนื่อยล้า, ภาวะซึมเศร้า, ระยะของโรค.

Cancer is one of the most common health problems that disrupt human life. It is the first leading cause of death in Thailand.⁽¹⁾ To be more exact, breast cancer patient accounts for the largest percentage of cancer patients who are female and new case.⁽²⁾ Chemotherapy is one of the treatments that is frequently used for cancer patients. Both the disease itself and the treatment that it requires have an influence on the patients' QOL, which is the most important outcome that is currently used to evaluate any therapeutic intervention. Therefore, in an attempt to maintain and improve the QOL of cancer patients, the factors associated with QOL need to be carefully and thoroughly examined.

QOL is the ultimate health outcome among chronically ill patients including cancer patients. The results from the study conducted by Thanasilp and Kongsaktrakul⁽³⁾ showed that breast cancer patients undergoing chemotherapy perceived their quality of life at a moderate level. Padilla and Grant⁽⁴⁾ defined QOL as the perception of well-being, satisfaction and happiness in a patient's life. It has the multidimensional aspects of physical well-being, psycho-spiritual well-being, treatment response, symptom control and a societal dimension. Generally, most breast cancer patients undergoing chemotherapy are confronted with much suffering that can impair various dimensions of the QOL.

In this study, the Symptom Management Model proposed by Dodd *et al*⁽⁵⁾ was selected as the conceptual framework. According to the model, symptom experience, symptom management strategies and symptom outcomes are interrelated. Additionally, personal factors, health and illness factors and environmental factors are related to those

three concepts.⁽⁵⁾ However, it is noteworthy that only the factors that are related to the QOL of breast cancer patients undergoing chemotherapy, namely symptom status, social support and stage of disease were investigated in the present study.

The major symptoms that usually occur in cancer patients are pain, fatigue, depression and insomnia.⁽⁶⁾ They occur from the pathology of the disease and from the side effects of chemotherapy and they can negatively affect both the patients' mood and their abilities to perform daily activities. Breast cancer patients also have to deal with symptom of distress, both physical and psychological. For this reason, patients with these symptoms tend to perceive their quality of life as low. A study carried out by Thanasilp and Kongsaktrakul⁽³⁾ found that fatigue experience was significantly negatively correlated with QOL ($r = -.41$; $P < .01$) and could account for 4% of the variance ($R^2 = .04$; $P < .01$).

Social support is an environmental factor in the model that is related to QOL. Previous studies have indicated that social support is positively correlated with QOL in cancer patients with statistical significance.^(3,7-8) Likewise, Pedro⁽⁹⁾ found that the loss component of social support had a significantly negative relationship with the QOL of patients with cancer ($r = .38$; $P < .01$), and Manning-Wash⁽¹⁰⁾ discovered that social support could predict QOL in breast cancer patients.

The stage of the disease is the illness factor in the model that involves QOL. Previous studies have reported that the stage of the disease is significantly negatively correlated with the QOL in chronically ill patients.⁽¹¹⁻¹³⁾

Therefore, this study was conducted to examine the associated factors including pain, fatigue, depression, insomnia, social support and stage of cancer with the QOL of breast cancer patients undergoing chemotherapy. It is anticipated that the study findings can serve as the basic knowledge necessary for developing effective nursing interventions to promote the QOL of breast cancer patients undergoing chemotherapy.

Materials and Method

Research Design

A cross-sectional descriptive design was used in this study, which was a secondary data analysis that utilized the data taken from a study conducted by Wongpromchai.⁽¹⁴⁾

Participants

One hundred and fifty female patients with breast cancer who were receiving chemotherapy were recruited from Ramathibodi Hospital and the Mahavajiralongkorn Cancer Center by simple random sampling method. The criteria for eligibility included: having received chemotherapy more than two times, being older than 20 years of age, being able to communicate in Thai, having a willingness to participate in the study and not receiving radiation treatment for their cancer. The hospital review boards for the protection of human subjects have approved the study before the commencement of data collection.

Instruments

The instruments in this study included the following: 1) The Personal Data Form, 2) Fatigue

Experience Scale, 3) Pain Scale, 4) Depression Scale, 5) Sleep Disturbance Scale, 6) Social Support Questionnaire, and 6) Quality of Life Index. These instruments are described below.

1. **The Personal Data Form:** The researchers developed the Personal Data Form to collect data on the attributes of participants including age, religion, marital status, educational background, monthly income, type of chemotherapy, hemoglobin level, and stage of cancer.

2. **Fatigue Scale:** This scale was modified by Dalopakarn and Chitpunya⁽¹⁵⁾ from the Fatigue Questionnaire of Piper *et al.* (1998). It is composed of 22 items in a linear analogue scale that is 10 millimeters long with values ranging from "perceive less fatigue experience" (0) to "perceive most fatigue experience" (10). The total composite scores of fatigue range from 0 to 220, that are divided into 3 levels: mild (< 73.33), moderate (73.33 - 146.66), and severe (> 146.66), with higher scores indicating higher perceived fatigue symptom and vice versa. Cronbach's alpha coefficient of the scale in this study is .94.

3. **Pain Scale:** This scale was modified from the Pain Scale of McCaffery and Pasero.⁽¹⁶⁾ It consists of one item that is a numeric rating scale. The scores of pain range from 0 to 10 that are divided into 3 levels: mild (< 3.33), moderate (3.33 - 6.66), and severe (> 6.66), with higher scores reflecting higher perceived pain symptom and vice versa. The test-retest of the scale in this study is .89-.90.

4. **Depression Scale:** This scale was translated into Thai by Sriyong cited in Netkem⁽¹⁷⁾ from the Beck Depression Inventory. It contains 21 items that assess the perception of the individual self about the illness.

The items are classified in a four-point Likert scale ranging from 0 to 3 according to the intensity of the events in the items that occurred in the previous week. The total score is obtained from the sum scores of the 21 items with higher scores indicating a higher depression and vice versa. A sum score of 0 - 10 is a normal result, 11 - 17 mild to moderate depressive symptoms, and 18 or higher a clinically relevant depression. Cronbach's alpha coefficient in this study is .89.

5. Insomnia Scale: This scale has been translated into the Thai language by Kaewpang⁽¹⁸⁾ from Insomnia Severity Index of Morin (1993). It is composed of seven items categorized into three dimensions: difficulty in initiating sleep, difficulty in maintaining sleep and early morning awakening. Each can be answered on a five-point Likert-scale between 0 and 4. The total score is obtained from the sum scores of the seven items that are divided into 3 levels: mild (< 9.33), moderate (9.33 - 18.66), and severe (> 19), with higher scores indicating a higher level of insomnia and vice versa. Cronbach's alpha coefficient in this study is .96.

6. Social Support Questionnaire: In this study, social support was measured with the Social Support Questionnaire based on Houses conceptualization. Yainontad (1999) developed this questionnaire and Rattananont and Thanasilp⁽⁸⁾ modified it specifically for breast cancer patients. It consists of 20 items, which assess the adequacy of the patients' perceived levels of emotional support, information support, instrument support and appraisal support. The items are arranged in a five-point Likert-scale with responses ranging from "strongly disagree" (1) to "strongly agree" (5). The total composite scores range

from 20 to 100 that are divided into 3 levels: mild (< 33.33), moderate (33.33 - 66.66), and severe (> 66.66), with higher scores reflecting higher family support and vice versa. Cronbach's alpha coefficient in this study is .93.

7. Quality of Life Index: Hanucharoenkul⁽¹⁹⁾ translated this scale into Thai, it was the instrument constructed by Padilla and Grant (1985). It is composed of 19 items in six dimensions: physical/general well-being; emotional/psychological well-being; body image concerns; diagnosis/treatment: surgical, diagnosis/treatment; nutritional; and social interaction. It is a linear analogue scale that has 100 millimeters in length with values ranging from 0 to 100 points for each item. The total composite scores of the quality of life range from 0 to 1900 that are divided into 3 levels: mild (< 33.33), moderate (33.33 - 66.66), and severe (> 66.66), with higher scores indicating a higher quality of life and vice versa. Cronbach's alpha coefficient in this study is .91.

Data collection

To ensure human rights protection, the study proposal was submitted to the ethics committee directors. After permission has been granted, eligible participants were informed about the study. Participants who agreed to take part in the study were asked to give verbal consent before completing the questionnaires including the Personal Data Form, Fatigue Experience Scale, Pain Scale, Depression Scale, Insomnia Scale, Social Support Questionnaire, and Quality of Life Index. It took approximately one hour to complete all questionnaires. After that, the researcher examined the questionnaires to ensure data completeness.

Data analysis

Data analysis included the application of descriptive and inferential statistics was used by Statistical Package for the Social Science version 11.5 (SPSS Inc. Chulalongkorn University). The demographic data of the participants was analyzed by means of descriptive statistics, while the relationships between four symptoms, social support and quality of life were analyzed using Pearson's Product Moment Correlation. Hierarchical multiple regression analysis was also employed to examine the effect of explanatory factors acting joining on QOL. Statistical significant was set with *P* value of .01.

Results

As regards the patients' demographic characteristics, the findings showed that about three-quarters (73%) of the participants were married. Moreover, more than half (55%) of the participants had mild anemia, and 53% had low income. Close to half, or 45%, of the participants were between 51 and 60 years of age with the mean age was 48.74 years (SD = 7.72), and 57% of them had stage I or stage II of cancer. Additionally, almost two-thirds, or 65%, were receiving the Anthracyclin containing regimen.

After assessing the assumptions underlying Pearson's Product Moment Correlation and multiple regression, the results showed that there were

no violations of the assumptions that existed. Therefore, Pearson's Product Moment Correlation and hierarchical multiple regression were used in this study. For the stage of cancer that was numeric scale was grouped into two categories: stage I or stage II and stage III or stage IV. Then they were created to dummy variables (0 & 1) while stage I or stage II was referred to as an indicator variable.

The mean scores of quality of life, fatigue and social support were at a moderate level but the mean scores of pain, depression and sleep disturbance were at a mild level (see Table 1). In the bivariate analysis, all independent variables were significantly negatively correlated with QOL except social support that had a significantly positive relation with QOL (see Table 2). In the multivariate analysis, the criterion for determining the best-fitting model was based on the *F* test, which indicated the statistical significance of the overall model. The final model described the effect of three explanatory variables consisted of depression, fatigue and stage of cancer acting jointly on the QOL (see Table 3) which could explain 71% (adjusted $R^2 = .71$) of the variance in QOL. Regarding the various beta weights (β) of the final model, depression was an important factor in increasing QOL ($\beta = -.57$; $P < .01$) then followed by fatigue ($\beta = -.31$; $P < .01$) and stage of cancer ($\beta = .15$; $P < .01$), respectively.

Table 1. Demographic characteristics of the participants (n = 150).

Variable	Number	%
Religion (Buddhist)	138	92.00
Marital status (Married)	110	73.30
Type of treatment (Anthracyclin containing regimen)	98	65.30
Stage of disease (stage I or stage II)	85	56.70
Hemoglobin (10 - 11.99 gm/dl)	83	55.30
Income (0 - 10,000 Bath)	79	52.70
Age (51- 60 year)	68	45.30
Educational background (B)	57	38.00

Table 2. Means, standard deviation, range, and level of major variables (n = 150).

Variables	Mean	SD	Possible Range	Level
Quality of life	66.43	13.94	0-100	Moderate
Fatigue	114.25	43.92	0-220	Moderate
Depression	12.99	6.86	0-63	Mild
Pain	2.90	2.95	0-10	Mild
Sleep disturbance	11.77	7.42	0-28	Mild
Social support	72.87	7.80	1-100	Moderate

Table 3. Correlation between pain, fatigue, depression, sleep disturbance, social support and stage of cancer and QOL (n = 150).

Variables	Correlation (r)
Fatigue	-.71**
Depression	-.81**
Pain	-.46**
Sleep disturbance	-.41**
Social support	.20**
Stage of cancer	-.30**

** $P < .01$ **Table 4.** Significant statistical predictors of the quality of life of breast cancer patients undergoing chemotherapy (n = 150).

Predictors	R ² change	b	SE	β	t-value
Constant	-	90.10	1.91	-	47.26**
Depression	.65	-1.13	.13	-.56	-8.80**
Fatigue	.04	-0.10	.02	-.31	-5.10**
Stage of cancer	.02	4.27	1.29	.15	3.32**

Total R² = .72, adjusted R² = .71** $P < .01$

Discussion

According to the findings of the study, the QOL of breast cancer patients undergoing chemotherapy was of moderate level, which was similar to the findings of previous studies.^(3, 20) All independent variables including pain, fatigue, depression, sleep disturbance, social support and stage of cancer were significantly associated with QOL.

Further analysis showed that depression was the strongest factor that had a significantly negative effect on QOL ($\beta = -.57$; $P < .01$). In general, depression is an emotional symptom that makes patients lose themselves, their image and their feelings. It interferes with daily living and their quality of life as well. Therefore, for breast cancer patients undergoing chemotherapy in this study, the presence of depression resulted in a lower level of QOL. Similarly, Dodd *et al*⁽⁵⁾ pointed out that symptom status is directly associated with the QOL. As depression in this study reflected symptom status in the model, this particular finding yielded support to the premise in the Symptom Management Model.⁽⁵⁾ The significant effect between depression and QOL was supported by previous studies.^(21 - 23)

Further results showed that fatigue had a significantly negative effect on QOL ($\beta = -.31$; $P < .01$). As fatigue is a part of symptom experience, this particular finding yielded support for the proposition in the Symptom Management Model.⁽⁵⁾ This finding was consistent with the result of Thanasilp and Kongsaktrakul⁽³⁾ that fatigue experience had a significantly negative effect on QOL of breast and lung cancer patients undergoing chemotherapy. Likewise, the significant effects of fatigue on QOL were

supported by previous studies.^(20, 22 - 25)

Furthermore, it was discovered that stage of cancer had a significantly negative effect on QOL ($\beta = .15$; $P < .01$). The participants who were at stages I or II of cancer might have a higher level of QOL than those at stage III or IV. Patients who were in an advanced stage of cancer usually found their QOL were greatly affected by the cancer. The significant effect of stage of disease on QOL was supported by previous studies.⁽¹¹⁻¹³⁾ Thus, the present findings support a causal relationship between the stage of cancer and QOL as stated in the Symptom Management Model.⁽⁵⁾

The Symptom Management Model⁽⁵⁾ was employed as the conceptual framework of this study. The dependent variable was QOL, while six independent variables were pain, fatigue, depression, sleep disturbance, social support and the stage of cancer. The final model of this study showed that the three selected variables of depression, fatigue and the stage of cancer could explain 71% variance of QOL. The predominance of depression was the important factor in this study.

In conclusion the propositions as stated in the Symptom Management Model were thus partially supported. In order to successfully promote QOL in breast cancer patients undergoing chemotherapy, nurses should help them manage or control the severity of depression and fatigue symptoms.

Suggestions

Based on the findings and the knowledge gained from this study that is limited by a cross sectional design, a longitudinal study design needs to be employed to provide a more causal explanation.

As a consequence, the possibility of designing effective nursing interventions to reduce the severity of depression and fatigue should be further explored.

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