Psychometric properties of Quality-of-Life Index for Vietnamese women with breast cancer three weeks postmastectomy

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Abstract

Background: The patient's quality of life immediately after mastectomy usually receives less attention than the quality of life after three months, six months, or a year. It is because the focus is mainly on surgical complications. Many instruments measure the quality of life from three months onwards. Still, the quality-of-life instruments right after postmastectomy are not yet verified.

Objective: This paper aimed to test the reliability and validity of the Quality-of-Life Index Vietnamese version (QOLI-V) in Vietnamese women with breast cancer three weeks postmastectomy.

Methods: The descriptive cross-sectional study was designed to analyze the psychometric properties of a Vietnamese version of the modified Quality of Life Index. The modified process was conducted after granting permission from the original authors. The content validity of the modified index was examined by five experts. Brislin's model was used for the translation process. The 26-item QOLI-V was tested in 265 patients with breast cancer stage II three weeks postmastectomy who expected to have a poorer quality of life score. The reliability of the index was measured using Cronbach's alpha. The construct validity was examined using confirmatory factor analysis (CFA).

Result: The content validity index results showed that the lowest I-CVI was .80 and the highest was 1.00. S-CVI/Ave was 0.95, and S-CVI/UA was 0.76. The Cronbach's alpha of QOLI-V was .84, which was considered acceptable. Most of the 26 items featured the correct item-total correlation of .30 to .60. There were only two items correlated with the total scale at .18, and the item with the lowest correlation (.06) was deleted from the item set. The CFA of model 1 with 26 items was not an ideal fit with the data, with Chi-Square/df = 2.15, CFI = .815, GFI = .853, TLI = .792, RMSEA = .066. After deleted an item #general quality of life, and the CFA of model 2 was conducted on the 25-item index. The final result indicated the improvement of the model fit, with Chi-Square/df =2.26, CFI = .852, GFI = .814, TLI = .790, RMSEA = .069.

Conclusion: The 25-item QOLI-V version is considered valid and reliable to measure the quality of life of Vietnamese women with breast cancer three weeks postmastectomy. Nurses and midwives could use this instrument to measure the quality of life of the patients, and the patients could use it for self-assessment.

Keywords

quality of life; mastectomy; factor analysis; psychometrics; nursing; Vietnam

Patients with breast cancer feel considerable uncertainty when diagnosed with a life-threatening (or terminal) illness. Later on, patients facing the treatment process realize these are events they could not foresee and are therefore wholly unprepared. From systematic reviews, the stage from mastectomy one month to initial chemotherapy

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represented a transition time of poor adjustment and decreased quality of life (Paraskevi, 2012). However, most of the studies focus on describing and providing support for quality of life as much as three months, six months, or over one year postmastectomy, but ignoring the immediate poor quality of life for the patients in the hours, days, and weeks after their mastectomy during the transition from hospital to home (Razdan et al., 2016). According to previous studies, it has been shown that decreased quality of life after surgery may predict early treatment discontinuation in patients with breast cancer (King et al., 2000; Richardson et al., 2007). The later poor quality of life will lead to reoccurrence, metastatic, or even death among this group (Coates et al., 2000; Mols et al., 2005). Thus, poor quality of life in patients with breast cancer postmastectomy exists as an urgent problem and requires effective interventions to reduce it. In addition to introducing a measure for the concept of quality-of-life postmastectomy, a reliable and valid scale must necessarily be established.

Definition of Quality of Life of Patients Postmastectomy

Quality of life (QOL) is the primary goal that most people attain during their daily life. Since this concept has been recognized, QOL is not separate from health because it is considered as the person's sense of well-being that stems from the satisfaction and dissatisfaction with aspects of life (Ferrans, 1990) or functional capacity, symptoms (physical and psychological) and perceptions of health (Mccorkle et al., 1989). The quality of life in the nursing context is related to a specific illness, and it can be considered similar meaning with health-related quality of life. A concept analysis of nursing, based on the guiding theory of Peplau's, Rogers', Leininger's, King's, and Parse, is defined as a contextual, intangible, subjective perception of one's lived experience (Plummer & Molzahn, 2009). Cella (1994) identified four dimensions of quality of life in the context of cancer that encompasses physical well-being, functional well-being, emotional well-being, and social well-being. The concept of Cella (1994) and its four significant domains of quality of life help investigate the concept multi-dimensionally. Besides, (Padilla & Grant, 1985) describe the quality of life as five dimensions: physical well-being, social concerns, body image concerns, psychological well-being, and diagnosis/treatment response. In breast cancer, the concept of QOL describes the impact of breast cancer on the domains of physical, social, psychological well-being, and spiritual well-being (Ferrell et al., 1998).

Receiving a mastectomy also raises concerns about body image, uncertainty in the situation of illness, surgical symptoms, lacking nursing care or social support, and poor patient-physician communication impacting the patient's quality of life (Denieffe et al., 2014; Mandelblatt et al., 2003; Wronska et al., 2007). Thus, in patients with breast cancer postmastectomy, the concept of quality of life should be more specific, clearly describing the situation, which occurs among this group. That is why the definition of QOL defined by Padilla and Grant (1985) as physical well-being, social concerns, body image concerns, psychological well-being, and diagnosis/treatment response remains the most suitable application for QOL postmastectomy.

Following Padilla and Grant (1985), physical well-being can be considered a strength, fatigue, ability to work, current health, and perceived usefulness. Psychological well-being implies happiness, satisfaction, fun, general QOL, pleasure in eating and sleep. The body image concerns mean the ability to look at the changes in one's body, the tendency to worry, and the ability to adjust and live with body changes. The social concerns focus on social rejection, social contact, or the need for privacy. Diagnosis/treatment response relates to surgical treatment symptoms, which are defined as the ability to have sufficient sexual activity, nutrition, weight, pain, and severity of pain, nausea, and vomiting (Padilla & Grant, 1985). In postmastectomy patients, the attributes of physical, psychological, and social concerns of QOL might be the same as other cancers; however, the defining attributes of body image and treatment response might differ. The body image in breast cancer patient postmastectomy relates to the ability to look at the changes of the body, worry over scarring, perceived femininity, and how easy it is to live with anybody changes (Barolia, 2008; Denford et al., 2011; Fobair et al., 2006; Lindwall & Bergbom, 2009; Toriy et al., 2013). The treatment response of mastectomy patients focuses on symptoms around the hand and shoulder such as the ability to raise the hand, any swelling of the arm, the sensitivity of the breast incision, sufficient nutrition, weight, as well as the severity and frequency of pain (Champion et al., 2014; Janz et al., 2007; Taghian et al., 2014). Operationally, the concept of quality of life on postmastectomy patients is defined as the perception of life experienced based on five domains: physical well-being, psychological well-being, body image concerns, social concerns, and treatment responses. Defining attributes of QOL consist of physical well-being (strength, fatigue, ability to work, current health and perceived usefulness), psychological well-being (happiness, satisfaction, fun/hobbies, eating pleasure and sleep), body image concern (look at the body, scare of scarring, perceived femininity, ability to live with losing a breast, the worry of future living without a breast), social concerns (family, friends or healthcare giver staff contact, social rejection, and privacy needs and treatment responses (ability raising the hand, swelling of the arm, sensitive of destroying breast, nutrition sufficient, weight, severity, and frequency of pain)

Existing Instruments

Most of the effective existing instruments measuring the quality of life for patients with breast cancer are all well-known instruments that have been used to examine QOL in many stages of breast cancer (Perry et al., 2007). Among those, FACT-B and EORTC-BR23 are specific for patients during chemotherapy treatment. QOL-BR23 focuses on physical function, whereas FACT-B

emphasizes emotional well-being (Nguyen et al., 2015). EORTC-QLQ30 and SLDS-BC or QOLI are suitable for QOL in general. Interestingly, the QOLI of Padilla and Grant (1985) is based on the concept of QOL across a range of cancers in women, though sharing similar circumstances to breast cancer patients, such as cervical cancer, colorectal cancer, and hysteric cancer post-surgery. The original QOLI of Padilla and Grant (1985) identifies 14 factors and has been validated in many studies measuring QOL; hence it has proven validity and reliability (Rukholm et al., 1998). Over time, the QOLI has been modified for colostomy patients by adding nine items focusing on some aspects of symptoms post-surgery. The dimensions of QOLI would seem to be closest to the definition of quality-of-life postmastectomy with five domains of physical well-being, psychological well-being, social concerns, body image concerns, and treatment/diagnosis response. The length of 23 items with self-administer base on the visual line for the most concern in the past four weeks. Summarily, with the same aspects of colostomy and mastectomy on colorectal and breast cancer patients, the QOLI of Padilla and Grant (1985) covers most aspects of the operational definition of quality of life postmastectomy. Thus, this instrument will be selected to test the psychometric properties in the breast cancer population postmastectomy. The summary of the comparison of the tools measuring QOL is presented in Table 1.

Table 1 Summary of existing instruments measuring QOL for patients with breast cancer

Name & Authors	Purpose	Domains	Scale	Duration	Items	Type	Reliability	Validity
European Organization for Research and Treatment of Cancer QOL Breast Cancer-Specific Version (EORTC QLQ-BR23) (Sprangers et al., 1996)	QOL in the breast cancer population at various stages and with patients with differing modalities	5 (Therapy side effects; arm symptoms; breast symptoms; body image; sexual functioning)	Four-point Likert scale ranging from 1 (Not at all) to 4 (Very much)	Past week	23	Self-report (10 minutes)	Reliabilities ranged from .70 to .91	Discriminant validity of mutually exclusive groups based on their initial performance status scores produced medium to large effect sizes ranging from .43 to 1.1
European Organization for Research and Treatment of Cancer QOL Cancer-Specific Version (EORTC QLQ-C30) (Aaronson et al., 1993)	QOL in the general cancer population	9 (Physical; role, cognitive; emotional; social; fatigue; pain; nausea and vomiting; global health status and quality of life)	Four-point Likert scale ranging from 1 (Not at all) to 4 (Very much); 1 (Very poor) to 4 (Excellent)	Past week	30	Self-administered (Under 10 minutes)	Reliabilities ranged from .69 to .90. (Carlsson & Hamrin, 1996) Test-retest reliabilities ranged from .63 to .87 (Hjermstad et al., 1995)	The correlation coefficient between the QLQ-C30 and the Profile of Mood States (POMS) was .56 (Mclachlan et al., 1998).
Functional Assessment of Cancer Therapy – Breast Symptom Index (FACT-B) (Brady et al., 1997)	Specific to breast cancer patients	6 (Physical well-being; social/family well-being; emotional well-being; functional well-being; relationship with doctors; additional concerns)	Five points Likert scale ranging from 0 (Not at all) to 4 (Very much)	Past week	37	Self-report or interviewer-administered (estimated 25 minutes)	Internal consistency was .90	Spearman correlations between FBSI and FACT ranged from .34 to .84
Functional Living Index – Cancer (FLIC) (Morrow et al., 1992)	Assess the effect that cancer treatment and symptoms on functional ability in all areas of life	5(Physical functioning; mental functioning; social functioning; general health/well-being; gastrointestinal symptoms)	Answer questions by placing a vertical line at the point in the best present point	Past two weeks; Past month; Today	22	Self-administered (Under 10 minutes)	Reliability ranged from .64 to .87 (Morrow et al., 1992)	Correlation coefficients between FLIC and SF-36 ranged from .50 to .62 (Wilson et al., 2005).
Life Satisfaction Questionnaire (LSQ) (Carlsson & Hamrin, 1996)	Measure one's general sense of satisfaction with life as it relates to school, relationships, leisure time, religious practices, and overall health for women with breast cancer	6 (Quality of family relation; physical symptoms; socioeconomic situation; quality of daily activities; sickness impact; and quality of close friend relation)	Seven points Likert scale ranging from 1 (very much) to 7 (Not at all)	Past week	32	Self-report (estimated 20 minutes)	Reliabilities ranged from .62 to .92	Correlation coefficients between LSQ and EORTC QLQ-C30 were -.68 to .54

Table 1 (*Cont.*)

Medical Outcome Short Form Health Survey (SF-36) (Ware et al., 1993)	Developed to assess health-related QOL	8 (Physical functioning; role limitations due to physical health; role limitations due to emotional problems; energy/fatigue; emotional well-being; social functioning; bodily pain; health)	Scaled using various scales	Unspecified	36	Self-administered (5 minutes)	Reliability ranged from .74 to .98 (Hays et al., 1995)	Correlation coefficients between the SF-36 and the General Health Questionnaire (GHQ-29) were -.35 to =.61 (correlations are negative because the two scales run in opposite directions) (Failde & Ramos, 2000)
Quality of Life Index (QL-Index) (Spitzer et al., 1981)	Assess health outcomes of those with cancer and other chronic diseases	5 (Activity; daily living; health; support; outlook)	Three points Likert Scale	Past two weeks	5	Interviewer administered or self-administered (Under 10 minutes)	Internal consistency of .78	Correlation coefficients ranged from .40 to .63 (32)
Satisfaction with Life Domains Scale for Breast Cancer (SLDS-BC) (Spagnola et al., 2003)	Developed for satisfaction with life among breast cancer patients	5 (Social functioning; appearance; physical functioning; communication with medical providers; spirituality)	Seven points Likert-type scale ranging from 1 (A "delighted" face) to 7 (A "very unhappy" face	Unspecified	32	Self-report (estimated 20 minutes)	Reliabilities ranged from .90 to .93	Correlation coefficient between SLDS-BC and FACT-B was .59
World Health Organization Quality of Life – Brief Version (WHOQOL-BREF) (Whoqol Group, 1998)	Designed to examine domain level profiles assessing the quality of life	4 (Physical health; psychological; social relationships environment)	Five points Likert scale with varying anchors	Past two weeks	26	Self-administered (estimated 15-20 minutes)	Reliability ranged from .66 to .84. Similar alphas have been shown for test-retest reliability ranging from .66 to .87	Correlation coefficients between the WHOQOL-BREF and SF-36 ranged from .36 to .78 (Da Silva Lima et al., 2005)
Quality of Life Index (Padilla & Grant, 1985)	Examine the quality of life of colostomy patients	4 (Physical concerns, psychological concern, social concern, body image concerns, treatments, and responses	10 points analog scale. Patients placing a vertical line at the point in the best present point	Past one month	23	Self-administered 10 minutes	Reliability Ranged from .65 to .85	

Methods

Study Design

The descriptive cross-sectional study was designed to analyze the psychometric properties of a Vietnamese version of the modified Quality of Life Index (QOLI-V) on patients three weeks postmastectomy. The modified process was conducted by researchers after granting permission, acceptance, and consultation of the original authors.

Sample and Setting

The population of this study was the patients three weeks postmastectomy at the Breast Surgical Oncology Ward in the Oncology Hospital in Ho Chi Minh City, South of Vietnam. Convenient sampling was used to select the respondents. The inclusion criteria of the respondents were aged 30-60, could read and write Vietnamese, no other diseases, and normal surgical recovery process at seven days.

The literature suggests the estimated sample size of CFA should not be less than 200 to avoid violating the thumb rule of "too few degrees of freedom" (Hair et al., 2010). Other assumptions requested that the sample was > 200 for the theoretical model or ≥ 300 for the population model for CFA in physical health care. A systematic review also proposed that the number of subjects should be equal to the number of items multiplied by 10 in the nursing field (Watson & Thompson, 2006). It is estimated that 265 patients were included to test the psychometric properties of QOLI_V, with 26 items modified from QOLI (Padilla & Grant, 1985) combined with the five domains.

Instrument Validation

The demographic form and the modified quality of life index Vietnamese version (QOLI-V) were used to collect data in this study. The demographic form was developed by the researchers asking about the characteristics of the respondents, such as age, marital status, occupation, education, income, and mastectomy type.

The QOLI_V was a 26-item questionnaire composed of five domains: physical well-being, psychological well-being, social concerns, body image concerns, and treatment response. Data were indicated by marking an X on the visual line equal from 0 to 10 score. Scores were presented as numeric rating scales. QOL was calculated by the sum of the scores divided by the sum of items with a low score indicating a low QOL. The original QOLI with 23 items retained with five domains. In reference to the concept of QOL in a mastectomy group, four items related

to the symptoms of patients with breast cancer postmastectomy, including swollen arms, the ability to raise hands, the sensitivity of breast incision was added to the section on treatment response and perceived femininity was added to the section on body image concerns.

Then the 27-item QOLI was sent to five experts for testing its content validity index following the recommendation of Polit et al. (2007): two surgeons with ten years of experience in the mastectomy process, two Ph.D. nursing lecturers, and one head nurse in the Breast Surgical Department. The results showed that the lowest I-CVI was .80 and the highest was 1.00; S-CVI/Ave was .95, and S-CVI/UA was .76, which implied good validity for this instrument (Osanloo & Grant, 2016; Polit et al., 2007). The CVI testing of 5 experts confirmed that for 26 items, most of all item was rated from 3 (relevant) to 4 (very relevant). The sum agreements of each item related to the quality-of-life postmastectomy were calculated. The result confirmed that most of the items correlated well with the quality-of-life postmastectomy, except the item of sufficient sexual satisfaction (.40). Experts rated this item with a lower score of relevancy and recommended researchers consider the meaning of this item on Vietnamese culture.

Instrument Translation

The 26 item-modified QOLI was translated into Vietnamese using Brislin's model. It was translated from English into Vietnamese and back-translated by two different bilingual experts at the Language Center, University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam. Two translated versions were reviewed by a Vietnamese nurse responsible for teaching English to nursing students in the university, identifying ambiguous words and confirming the symmetry. The Quality-of-Life Index Vietnamese version (QOLI-V) was then assessed for its intelligibility in the Vietnamese context and culture with 5 cases of patients in the Surgical Oncology Ward. The piloting of QOLI-V also showed that most patients skipped the question asking about sufficient sexual satisfaction after mastectomy. When researchers discussed the reason with patients, the answer was that mastectomy treatment was terrifying and tiring. They and their partner did not want to have sex, or it was of no meaning in the postmastectomy period. Based on the Vietnamese culture, women often feel shame and become uncomfortable when asked about sexual activities, or they could not express the meaning of sexual satisfaction. In the stage of three weeks postmastectomy, sufficient sexual satisfaction was felt completely irrelevant to ask because patients were usually concerned with other aspects of their life than sexual satisfaction. Therefore, this item was deleted from the questionnaire.

Ethical Consideration

This study was approved by the Board of Ethical in Biomedical Research at the University of Medicine and Pharmacy and the Research Ethical Board of Oncology Hospital. This study was an instrument development part of the Dissertation project for PhD education in the Faculty of Nursing, Chulalongkorn University, Thailand. After IRB approval, the researchers met patients and presented the objectives, procedures to collect data, and approximate length of time for data collection at the Surgical Oncological Ward. Patients who matched the inclusion criteria and wished to volunteer signed the consent form to prove that they agreed to answer the whole questionnaire.

Data Analysis

The input data were checked for errors before entering the analysis tests. The data were analyzed for the assumption of normal distribution and descriptive demographic data and reliability of the measurement by the SPSS program version 16.0. Then the confirmatory factor analysis was conducted by using the AMOS version 20.0. The process of conducting the CFA conducted by following standardized recommendations: (a) Initial data analysis to identify any problem of missing data or input errors, (b) Fix one-factor loading on each sub-construct to a specific value as equal to 1, (c) Factor loading higher .5 to .7, (d) Construct reliability .6 was accepted, (e) Standardize residual accepted (from 2.5 to 4.0), (f) Not using modification indices to adjust the model fit (Hair et al., 2010).

Results

Characteristics of the Respondents

Table 2 Characteristics of participants (*N* = 265)

Characteristic	*f*	%
Age		
30-39	60	22.6
40-49	125	47.2
50-59	80	30.2
Marital status		
Married	209	78.9
Widowed	29	10.9
Divorced	12	4.6
Singled	15	5.7
Education		
Primary school	75	28.3
Secondary school	84	31.7
High school	63	23.8
University or higher	43	16.2
Occupation		
Housework	112	42.3
Small business	52	19.6
Worker	57	21.5
Officer	31	11.7
Retire	13	4.9
Monthly income (VND)		
< 3 million	137	51.7
3-5 million	107	40.4
5-10 million	21	8.0
Mastectomy type		
Simple	94	35.5
Radical	171	64.5

The demographic data of the respondents showed that most of them were in middle age (47%). Many of the women were married and living together as a family (78.9%). However, the respondents had low education (primary and secondary school, 60.5%), and income from the main family members was still low (<3 million and/month, 51.7%). The majority of the respondents were housewives (42.3%), farmers, or doing small business at home (19.6%). Only one-third of them were office workers or executives; 64.5% of the respondents received radical mastectomy (see Table 2).

Reliability of the QOLI-V

The reliability of the revised translation version, 26-item QOLI-V, was tested for its reliability with 265 Vietnamese patients three weeks postmastectomy. Cronbach's alpha of QOLI-V was .84, which was considered acceptable for the modified instrument (Polit & Beck, 2003). Most of the 26 items featured the correct item-total correlation .3 to .6. There were only two items correlated with the total scale at .18. Regarding the last item, "general quality of life," the total correlation was only .06, and Cronbach's alpha increased when it was deleted. Thus, it was considered that this item should be deleted from the item set or not (see Table 3).

Table 3 Item correlation of Quality-of-Life Index Vietnamese Version

Items	Scale Mean if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Strength	172.82	.525	.832
Tired	171.63	.209	.841
Sleep	172.22	.469	.833
Weight	171.22	.185	.842
Appetite	171.96	.557	.829
Food amount	171.71	.521	.831
Daily work	173.94	.514	.831
Current health	172.82	.603	.827
Fun	173.26	.393	.836
Useful	171.99	.552	.829
Happiness	171.36	.556	.830
Worry of future	171.32	.236	.841
Life satisfaction	171.97	.525	.830
Pain	172.06	.284	.839
Frequency of pain	171.77	.396	.836
Arm swollen	170.28	.284	.839
Raise hand	171.82	.165	.842
Breast sensitive	171.53	.291	.839
Adjust easy	171.66	.374	.836
Scare of scar	171.50	.360	.837
Femininity	171.98	.288	.839
Difficult to look body	171.68	.329	.838
Meeting	172.22	.355	.838
Reject	170.26	.367	.837
Private	171.99	.318	.840
General quality of life	171.98	.060	.847

Construct Validity - Confirmatory Factors Analysis

The construct validity of the instrument was tested using the confirmatory factor analysis (CFA). The model validity is assessed based on exact test fit, with Chi-Square/df <2.0 is considered good and <5.0 is acceptable, Root Mean Square Error of Approximation (RMSEA ≤ .08), Standardized Root Mean Square Residual (SRMR ≤ .05), Comparative Fit Index (CFI ≥ .90) (Hair et al., 2010). The researchers also used other evidence to concern the appropriate model fit.

The initial model 1 was drawn up in the AMOS graphic program and run CFA with the data set. The first analysis showed that with 26 items based on the construct of 5 dimensions, model 1 was not an ideal fit with the data. The findings in detail were reported as Chi-Square/df 623/289 = 2.15, CFI =.815, RMSEA =.066. The model was presented in (Figure 1).

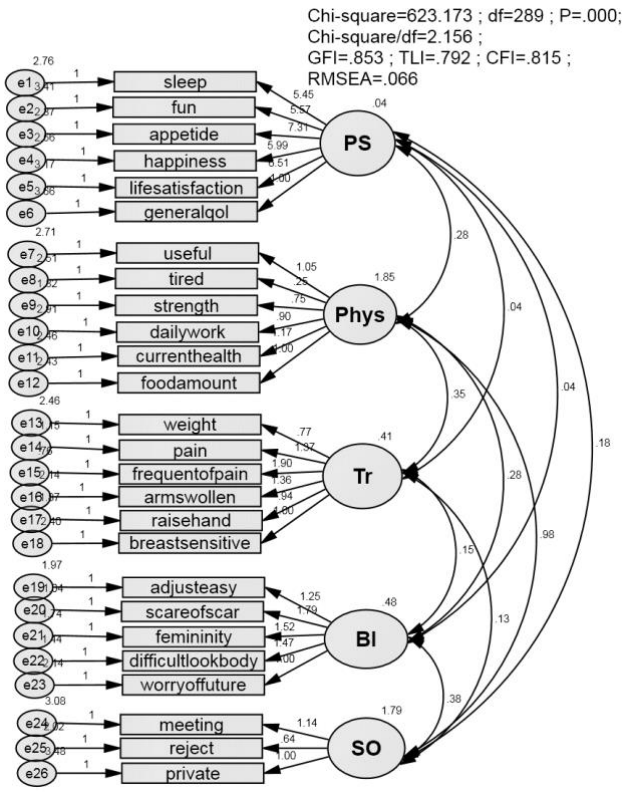

Figure 1 CFA Model 1

Note:
PS: Psychological well-being | Phys: Physical well-being | Tr: Treatment responses| BI: Body image concerns| SO: Social concerns

For most items, the standardized estimation (factor loading) was from .50 to .66. There is no estimation indicated the cross-loading factor. However, there were three items that the general quality of life, weight, and breast incision sensitivity were lower than .50, with the standardized regression weight estimated as .045, .48, .48, respectively. The residual estimation of 26 items ranked from 1.1 to 3.8 was acceptable based on the standardization rule. However, the residual estimate of e6 (general quality of life) exceeded the accepted level with the result at 4.2. The construct reliability of the measurement was high and exceeded the level of .6.

As for the modification indices, the general quality of life item is considered the cross-loading item. The

regression weight of these items was adjusted for the par change in every item or latent variable of the model. Therefore, this item was considered for deletion from the model.

Following the empirical evidence of the CFA in model 1, the general quality of life was deleted, and the CFA of model 2 was conducted. The findings showed that the model fit improved, with the criteria Chi-Square/df =2.269, CFI=.814, and RMSEA=.069. The construct reliability of the Psychological dimension was improved after deleted one item. The model was presented in Figure 2.

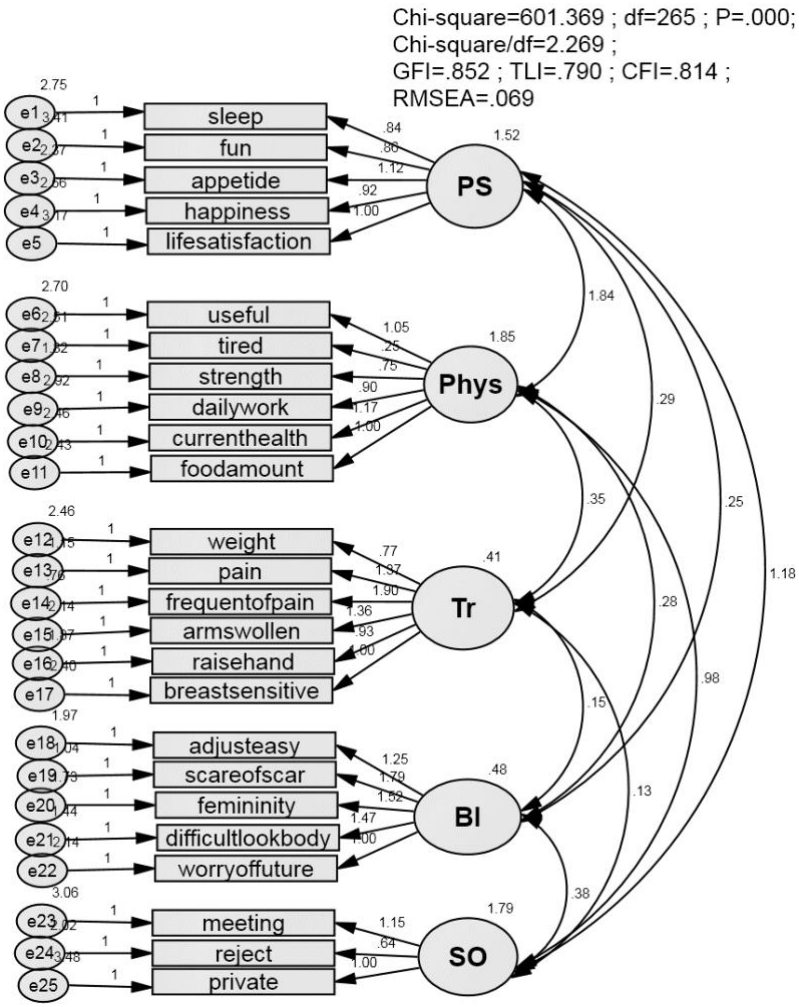

Figure 2 CFA Model 2

Note:
PS: Psychological well-being | Phys: Physical well-being | Tr: Treatment responses
BI: Body image concerns| SO: Social concerns

Discussion

Following Hair et al. (2010) to assess the model validity, we need the key value of Chi-Square/df, CFI, and RMSEA and other evidence to concern the appropriate model fit. Firstly, the confirmed factor analysis showed that the model of quality of life was acceptable as consistent with the concept. Although the Chi-square value was .00 (< .05) implied that the model might not fit. However, the Chi-square value may be influenced by the number of samples. In this study, 265 cases were higher than 250, as referenced (Boateng et al., 2018). When we considered the Chi-Square/df in both models, the result was 2.15-2.26, less than 3 acceptable occasionally (Hair et al., 2010). The CFI, GFI, TLI of these models was over 8 compared to the standard of >.9 (Hair et al., 2010). Although it was not a perfect fit, the model was considered good for measuring the quality of life. Regarding RMSEA, both models were acceptable, with RMSEA were .06 (< .08) suggested the adaptable criteria for model fit.

Secondly, from model 1 to model 2, there was a slight decrease of CFI, GFI, TLI with increased Chi-Square/df.

RMSEA increase proved that the deleted item " general quality of life" was not contributed to the quality of life or considered redundant. Therefore, this item was deleted from the model. Thirdly, although model 2 was not also highly fit with the result of Chi-Square/df =2.269, CFI=.814, and RMSEA=.069. The researcher did not try to rerun the model because this model was consistently based on CVI, Cronbach's alpha, and experts from a clinical view. Therefore, deleted more items did not help improve the model but ruin the construct of the quality of life in patients with breast cancer.

This study proposed the model for concept quality of life three weeks postmastectomy. The original model has been modified with four items and deleted two items through the process of developing the scale. The final 25-item QOLI should be tested in another group of patients with breast cancer in the early stage of treatment to conclude the validity and reliability of this scale. In addition, the construct of social concerns needs to be adjusted by adding the new constraints for increasing the decrease of freedom set up the tau-equivalent between each construct in the model following the suggestion of (Hair et al., 2010). The modification indices also suggested a high correlation between the appetite and food amount that may imply the redundancy of the item. This model should be considered for testing on a larger sample size to satisfy the assumption of the test and not violate the thumb rule of few degrees of freedom.

Conclusion

The findings of this study provided good reliability and validity of the QOLI-V among postmastectomy patients. The QOLI-V consisted of 25 items with five dimensions: physical well-being, psychological well-being, social concerns, body image concerns, and treatment response. Nurses and midwives can use this instrument to measure the quality of life of the patients with breast cancer postmastectomy, and the patients could use it for self-assessment.

Declaration of Conflicting Interest
There is no conflict of interest in this study.

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Authors' Contribution
HTNX designed the study, collected data, analyzed the data, wrote and revised the manuscript. ST designed the study, wrote and revised the manuscript. All authors contributed and agreed with the final version of the manuscript.

Authors' Biographies
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Data Availability Statement
The datasets of this study are available from the corresponding author on reasonable request. The final instrument is available in appendix.

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Appendix

The Quality-of-Life Index for patients with breast cancer three weeks postmastectomy

Modified from Quality-of-Life Index of Padilla and Grant (1985)

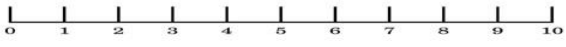
Instructions:

Please read each question and place an "X" on the line that most closely measures how you feel during the past weeks. The line level is measured from "Not at all" to "Completely/Extremely", with the score from 1 to 10. Please answer every question.

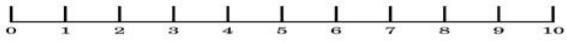
1. How much strength do you have?

   Not at all  A great deal

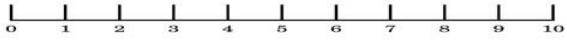
2. Is the amount of sleeping time sufficient to meet your needs?

   Not sufficient  Completely sufficient

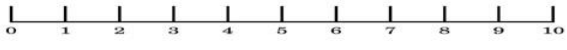
3. Do you feel tired easily?

   Not at all  A great deal

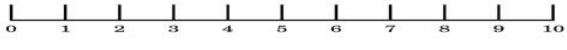
4. Do you feel your current weight is a problem?

   Not at all  A great deal

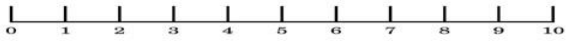
5. Do you find eating a pleasure?

   Not at all  A great deal

6. Is the amount of food you eat sufficient to meet your needs?

   Not at all  Completely sufficient

7. How much can you do your usual tasks (homework, office work, and gardening)?

   Not at all  A great deal

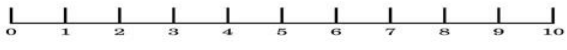
8. How is your present stage of health?

   Extremely poor  Excellent

9. How much fun do you have (hobbies, recreation, social activities)?

   Not at all  A great deal

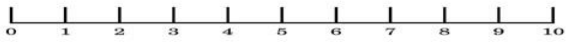
10. How useful do you feel?

    Not at all  Extremely useful

11. How much happy do you feel?

    Not at all  A great deal

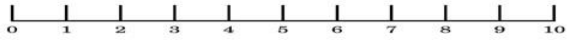
12. How satisfying is your life?

    Not at all  Extremely satisfying

13. How much pain do you feel in your arm and shoulder?

Not at all  Excruciating

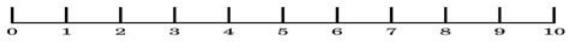
14. How often do you feel pain?

None  All the time

15. Do you have the arm or hand swollen?

Not at all  Extremely

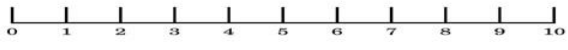
16. Is it difficult to raise your arm or move it sideways?

Not at all  Extremely difficult

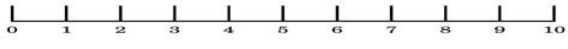
17. Is your devastated breast over-sensitive like tingling, itching, formication?

Not at all  Extremely sensitive

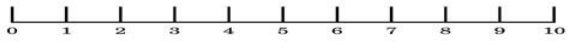
18. How worried are you about your future after mastectomy?

Not at all  A great deal

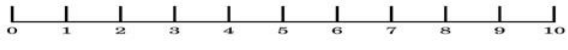
19. How easy is it to live with your devastating breast?

Not at all  Extremely fearful

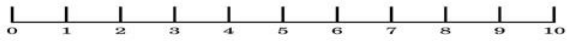
20. How difficult is it for you to look at your body postmastectomy?

Not at all  Extremely difficult

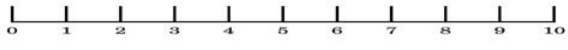
21. How fearful are you from the scar of devastating breast?

Not at all  Extremely fearful

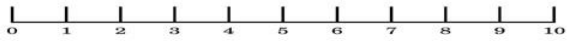
22. Do you feel less feminine as a result of mastectomy surgery?

Not at all  Extremely

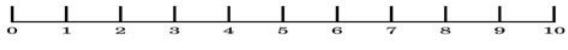
23. Is the level of contact with your friends and family sufficient to meet your needs?

Not at all  Completely sufficient

24. Do you feel rejected by your family or loved one?

Not at all  Extremely

25. Is the amount of privacy you have sufficient to meet your needs?

Not at all  Completely sufficient