

RESEARCH ARTICLE

Treatment-Related Quality of Life in Nepalese Women with Breast Cancer

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Abstract

Objective: To identify the level of quality of life and its predictors in Nepalese women with breast cancer while receiving chemotherapy. **Methods:** This cross-sectional study with a predictive design was conducted for a conveniently selected sample of 85 Nepalese women with primary breast cancer receiving chemotherapy at outpatient clinics of three cancer hospitals of Kathmandu, Nepal. Data were collected during December 2016 and February 2017 using demographic sheets, the European Organization for Research and Treatment of Cancer Quality of Life Core Questionnaire and the modified Medical Outcomes Study Social Support Survey. Descriptive and inferential statistics were employed for data analysis. **Results:** The mean age of the sample was 50.2 years (SD = 11.50). Study participants reported moderate to poor quality of life (M = 33.5, SD = 23.5). Multiple regression analysis showed that age, years of education, stage, past breast surgery, overall symptom severity, and social support significantly explained 56.8% of the variance in quality of life ($R^2 = .568$, $F(8,76) = 12.469$, $p = .000$). However, overall symptom severity ($\beta = -.477$, $p = .000$) and social support ($\beta = .183$, $p = .050$) were the most important predictors. **Conclusions:** As Nepalese women reported decreased quality of life, nurses should provide preventive and supportive services to improve the quality of life of their patients during chemotherapy.

Keywords: Breast cancer- Nepal- treatment- quality of life

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Introduction

According to the World Health Organization, breast cancer is the most common female cancer in the world with 1.67 million new cases diagnosed annually. In Nepal, breast cancer is the second common cancer in women contributing to 15.7% of all cancers (Pradhananga et al., 2009). Since 1990, there has been a 12.82-fold increase in breast carcinomas in Nepal (Pun et al., 2015). Chemotherapy is the most common treatment modality for breast cancer. Although chemotherapy improves breast cancer survival rates (Rossi et al., 2015), 12-40% of women experience severe chemotherapy-related symptoms including fatigue, pain, insomnia, and appetite loss (Alawadi and Ohaeri, 2009). In addition, quality of life (QoL) is a major concern among women receiving breast cancer treatment (Alawadi and Ohaeri, 2009; Bayram et al., 2014; Lua et al., 2012). Research suggests that more than half of the breast cancer patients report impaired QoL (Manandhar et al., 2014; Musarezaie et al., 2012). Many factors affect the QoL of women who are receiving chemotherapy (Alawadi and Ohaeri, 2009; Musarezaie et al., 2012; Phligbua et al., 2013; Safaee et al., 2008). However, among Nepalese women with breast cancer, little is known about their emotional adjustment and well-being. As such, additional research is warranted

to understand overall QoL and its correlates among this underserved population of women.

Quality of life refers to the “the degree to which a person’s life experiences are satisfying” (Zhan, 1992, p.796). Zhan’s QoL framework was used to understand the QoL and its associated factors in the current study. According to the model, QoL is multidimensional concept and includes the following domains; life satisfaction, psychological well-being, health and physical functioning and socioeconomic status. Factors thought to influence QoL includes background, health-related and social/cultural/environmental (Zhan, 1992).

Background factors including age and years of education affect the QoL in women with breast cancer during treatment. Studies reporting on the influence of age and QoL are somewhat mixed. Some studies have found low QoL in younger women (Kwan et al., 2010; Park et al., 2011), other studies have reported lower QoL in older aged women (Bayram et al., 2014; Ogce et al., 2007; Park et al., 2011) and some of them reported no effects of age in QoL (Musarezaie et al., 2012). The results relating to educational levels are also mixed. Some studies found association of education with QoL (Bayram et al., 2014; Musarezaie et al., 2012; Saleha et al., 2010), whereas others found no association (Ogce et al., 2007; Safaee et al., 2008). Similarly, some studies identified income and

marital status as associated factors of QoL (Akin et al., 2008; Alawadi and Ohaeri, 2009). Clinical factors also affect the QoL in women with breast cancer. Previous studies indicate that stage of the disease (Bayram et al., 2014; Filazoglu and Griva, 2008), type of past surgery (Filazoglu and Griva, 2008), and symptoms including overall symptom severity (Begum et al., 2016; Phligbua et al., 2013) adversely affect the QoL in this population. The positive effect of social support to improve the QoL of women with breast cancer has also been shown by many past studies (Filazoglu and Griva, 2008; Yan et al., 2016; Zou et al., 2014).

Although numerous studies of QoL among breast cancer patients have been conducted in western and other socioeconomically developed countries, the findings from these studies may not be directly applicable to women in low income countries like Nepal where distinct differences exist in social, religious, cultural context and health-care delivery systems compared to western countries. To date, only one published study has evaluated the QoL in women with breast cancer while receiving various kinds of treatment in Nepal (Manandhar et al., 2014). However, no specific studies have examined the QoL and its predictors in Nepalese women with breast cancer during chemotherapy. Chemotherapy-related symptoms are known to diminish their abilities to function physically, socially, sexually and emotionally (Camp- Sorrel, 2011) and affect QoL. Therefore, additional research is needed to develop preventive and supportive services as well as to develop interventional studies to improve their QoL specifically during chemotherapy.

Informed by Zhan's model, the objectives of this current study were to assess the level of QoL and to examine the associated background, clinical and social factors influencing QoL in Nepalese women with breast cancer while undergoing chemotherapy. In this study, background factors (age, years of education), clinical factors (stage, type of past surgery, and overall symptom severity) and social factor (social support) were selected to examine their predictive ability in QoL in Nepalese women with breast cancer during chemotherapy. The findings of the study will help to provide preventive and supportive services to improve their QoL.

Materials and Methods

Study design and participants

This is a cross-sectional predictive study conducted in eighty-five conveniently selected 18 years and older women at three cancer hospitals of Kathmandu, Nepal during December, 2016 to February, 2017. Women who were diagnosed with primary breast cancer, knew their diagnosis, received at least one cycle of chemotherapy, and who could communicate in Nepalese language were included in the study. Women diagnosed with psychiatric illness, experienced complications, and who were receiving concurrent chemotherapy and radiotherapy were excluded from the study. Sample size was calculated using power analysis based on the effect size of previous study ($f^2 = .42$) (Alawadi and Ohaeri, 2009). With the effect size $f^2 = .42$, power of .80, significance level 0.05, and for eight

independent variables, total minimum sample size came up with 44. For adequate power, data were collected from total 85 samples.

Measures

Participant's characteristics: Participant's background (age, years of education, marital status, occupation, religion, family monthly income and menopausal status) and clinical characteristics (duration of disease, type of breast cancer, stage of the disease, type of the past treatment including types of past surgery, lymph node dissection, current treatment, chemotherapy cycle and comorbidity) were collected using demographic sheet.

Overall symptom severity: To identify the overall symptom severity, one question was formed "how much did you distress with your overall symptoms in the past week?" Response options ranged from "not at all" (1) to "very much" (7). The score was transformed on a 0-100-point scale according to the scoring criteria of the symptom scales of EORTC QLQ-C30 with higher score indicating higher overall symptom severity.

Social support: Nepalese version of an eight-item, the modified Medical Outcomes Study Social Support Survey (mMOS-SSS) was used to measure social support. The mMOS-SSS is valid (Moser et al., 2012) and reliable (Cronbach's alpha > .70 in Nepal) (Manandhar et al., 2014). In the present study, Cronbach's alpha of .90 was found. It covers emotional and tangible support with a response option of "none of the time" (1) to "all of the time" (5). Scales scores were summed and transferred into a 0-100-point scale according to the scoring Manual (RAND Corporation, 2016). Overall social support score was calculated by averaging the scale scores. Social support score >80 was considered as good social support, 60-80 as fair social support and the score <60 was considered as poor social support (Manandhar et al., 2014).

Quality of life: European Organization for Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC QLQ-C30, version 3) (Aaronson et al., 1993) was used with permission (Quality of Life Department, 2016) to measure the QoL in the current study. Cronbach's alpha was .83 in prior Nepalese study (Shrestha et al., 2017) and .81 in the current study. Total 30 questions were divided into five functional scales, a global health status/quality of life scale, and nine symptom scales/items. The response options for the first 28 items were "not at all" (1) to "very much" (4). Item 29 (overall health) and item 30 (overall quality of life), were rated as "very poor" (1) to "excellent" (7). Raw scores were transformed on a 0-100-point scale according to the scoring manual of the EORTC QLQ-C30 (Fayers et al., 2001). The score of overall QoL (item 30) ranging from 0-100 was used in data analysis as the dependent variable in the present study. The score of overall QoL (item 30) ranging from 0-100 was used in data analysis as the dependent variable in the present study.

Ethical considerations

This study was approved by the Institutional Review Board of Faculty of Nursing, Mahidol University, Thailand (CoA No. IRB-NS2016/382.0411) and Nepal Health

Research Council, Nepal.

Data collection

Staff nurses at the outpatient clinic screened the potential participants for inclusion criteria. Then, the researcher approached them, explained the objectives, risks and benefits of the study and secured the written informed consent voluntarily. Data were collected by the principal investigator when the participants were waiting for or completed visit with medical oncologists (for chemotherapy) or while receiving chemotherapy. More than 90% of the participants were interviewed whereas remaining participants responded self-administered questionnaires after clarifying how to answer each item of the questionnaires. Total time for data collection took 25-30 minutes approximately for each participant.

Data analysis

Predictive Analytics Software version 18 (SPSS Inc. Chicago, 2009) was used for the data analysis. Participant's background and clinical characteristics, social support and QoL scores were analyzed by using descriptive statistics (frequency, percentage, mean, median, standard deviation and range). Univariate methods (ANOVA, independent sample t test, Mann Whitney U test) were used to identify the QoL according to the background and clinical characteristics of the participants. Pearson's product moment correlation was used to identify the relationship of between continuous independent and dependent variables. Then the significant (in univariate analysis and Pearson's product moment correlation) background, clinical and social variables (age, years of education, stage, type of past surgery, overall symptom severity and social support) were entered in the multiple linear regression analysis using enter method. Assumptions were tested for each statistical test. Significance level was set at ≤ 0.05 .

Results

Initially, 89 women with breast cancer were approached. Four of them were excluded from the study due to feeling unwell during the time of data collection. Therefore, statistical analysis for this study was done on the remaining 85 participants. There were no missing data.

Participant's characteristics

Referring to table 1, the mean age of the participants was 50.16 years (SD = 11.50). Most of the participants were married, Hindu, and unemployed. More than half were not formally educated. In clinical profiles (Table 2), most of the participants were diagnosed with infiltrating ductal carcinoma and had underwent surgery. The mean duration of diagnosis was 3.68 months (SD = 1.48).

Participant's level of quality of life including overall health, function, and symptoms/items

Referring to Table 3, the mean score of overall QoL was moderate to poor. In the functional scales, the best function was cognitive function while the social function was worst. Fatigue, appetite loss and insomnia were found

at moderate intensity. The participants reported severe financial difficulties.

Overall symptom severity

The overall symptom severity of the participants was at a moderate level with a mean score of 60.38 (SD = 23.84) and a range of 0-100.

Social support

The social support was at poor level (M = 58.50, SD = 17.24). Tangible support was better (M = 70.47, SD = 17.74) than the emotional support (M = 47.43, SD = 21.46).

Predictors of QoL among the participants

In the multiple regression analysis, all the independent variables significantly accounted for 56.8% of the variance ($R^2 = .568$, $F(8, 76) = 12.469$, $p = .000$) in the overall QoL. However, overall symptom severity ($\beta = -.477$, $p = .000$), and social support ($\beta = .183$, $p = .050$) were the significant predictors of QoL.

Discussion

In the current study, we examined the level of QoL and its associated background, clinical and social factors in Nepalese women who were receiving chemotherapy for breast cancer. The study by Gavric (2015) has also found the similar finding in women with breast cancer during treatment. However, the Nepalese women reported lower QoL than women in other previous studies (Alawadi and Ohaeri, 2009; Lobo et al., 2014; Safaee et al., 2008). As Nepalese women reported lower educational level, severe financial problem and more impaired health, these factors might influence negatively on the perception of QoL (Fayers, 2001) than the women in those studies.

In the functional scales, Nepalese women performed good cognitively and physically. Unlike our findings, Kuwaiti women with breast cancer (Alawadi and Ohaeri, 2009) were most negatively affected physically. This result was expected in Kuwaiti women as they were recruited at follow-up clinic for chemotherapy at which time many chemotherapy-related symptoms were possible. The participants in the current study were recruited on the day of chemotherapy, in which time most symptoms were subsided. However, Nepalese women were profoundly affected socially. Change in the appearance (mastectomy and hair loss), fear of infection, and symptoms due to treatment might affect socially. Congruently, the previous study revealed the similar result among women with breast cancer during treatment in Nepal (Manandhar et al., 2014).

In the symptom scales/items, the fatigue, appetite loss, and insomnia were reported with moderate severity. Results of the previous studies supported the findings of the current study (Alawadi and Ohaeri, 2009; Manandhar et al., 2014; Saleha et al., 2010; Zou, et al., 2014). Most of the women in the current study were receiving anthracycline and taxane-based chemotherapy, which are expected for the development of those symptoms (Chauhan et al., 2012). Taste changes, bone marrow depression, and possible anemia, worrying, feeling

Table 1. Participant's Background and Relationship with QoL (n = 85)

Characteristics	N	%	QoL		T	P
			Mean	SD		
Age (years)			33.52	23.49	r = -0.296	0.006
(Mean = 50.2, median = 50.00, SD = 11.50, Range = 26-75)						
<40	17	20				
40-60	50	58.8				
>60	18	21.2				
Marital status			33.52	23.49	1.384	0.17
Single (unmarried/divorced/widowed)	15	17.6	41.1	28.07		
Married	70	82.4	31.9	22.29		
Occupation					3.549-	1
Unemployed	60	70.6	28.05	21.14		
Employed	25	29.4	46.66	24.05		
Educational level (years of education)			33.52	23.49	r = 0.542	0
(Mean = 4.52, median=.00, SD = 5.62, Range = 0-17)						
No formal education	45	52.9				
Primary (1-5 years)	10	11.8				
Secondary (6-10 years)	17	20				
Intermediate (11-12 years)	3	3.5				
University education (above 13 years)	10	11.8				
Religion						
Hindu	68	80				
Buddhist	13	15.3				
Others	4	4.7				
Family monthly income (Rs.)			33.52	23.49	r = 0.238	0.028
(Mean = 32,470.58, median = 25,000.00, SD = 35,270.58, Range = 0-250,000)						
< 10,000	11	12.9				
10,001-20,000	15	17.6				
20,001-30,000	26	30.6				
30,001-40,000	10	11.8				
>40,000	23	27.1				
Menopausal Status					858	394
Premenopausal	38	44.7	35.96	23.73		
Postmenopausal	47	55.3	31.55	23.37		
			33.52	23.49	r = -0.038	0.729

uncertain and anxiety contribute for the existence of fatigue, appetite loss and sleep disturbance even after weeks of chemotherapy in these population (Bower, 2008). The overall symptom severity in the participants in this study was at moderate level and this fact was supported by the study in Bangladeshi women with breast cancer during chemotherapy (Begum et al., 2016).

In the current study, women reported poor social support (poorer emotional support than tangible support) while undergoing chemotherapy for breast cancer. Nepalese women are expected to maintain family harmony by serving family and giving importance to the family needs than their own needs (Luitel, 2001). This culture might lead to fear of expression of their needs due to their feeling of disruption of the family well-being. In addition, although breast cancer has been increasing in Nepal, family members might lack awareness about

the needs of women treating for breast cancer due to low educational level. The support provided by family and friends might not exactly match their real needs (Fernades et al., 2014). Therefore, the gender role, cultural practice and lack of awareness might negatively influence the perception of social support in the current study. This finding is supported by the previous study in Nepal (Manandhar et al., 2014) and in Egypt (Denewer et al., 2011).

In the multiple regression analysis, we found that overall symptom severity and social support directly and significantly predicted the QoL. The results have supported the hypothesis of our study. Also, our study results have partially supported QoL framework of Zhan (1992).

Numerous prior studies have revealed that symptoms including overall severity of symptoms and social support

Table 2. Participant's Clinical Characteristics and Relationship with QoL (n=85)

Characteristics	N	%	QOL		T	P
			Mean	SD		
Duration of disease in months (Mean = 3.68, median= 4.00, SD = 1.48, Range = 1-6)						
1-2 months	23	27.1				
3-4 months	32	37.6				
5-6 months	30	35.3				
Type of breast cancer						
Infiltrating ductal carcinoma	82	96.5				
Others	3	3.5				
Stage of the disease						
Stage I	15	17.6	33.52	23.49	.594a	0.017 ^a
Stage II	32	37.6	27.07	18.33		
Stage III	31	36.5	32.25	25.06		
Stage IV	7	8.2	33.33	23.57		
Type of past treatment						
Surgery	77	90.6	33.52	23.49	0.525	0.613
Others	8	9.4	29.16	24.8		
Type of past surgery (N = 77)						
BCS with ALND	13	16.9	51.27	22		
Others (MRM with ALND plus simple mastectomy and spinal surgery)	64	83.1	30.46	22.33		
Lymph node dissection						
Yes	73	85.9	33.52	23.49	-0.606	0.544 ^m
No	12	14.1	29.16	26.7		
Type of chemotherapy						
Adriamycin and cyclophosphamide or Epirubicin and cyclophosphamide 4 cycles	6	7.1				
Cyclophosphamide, Adriamycin and 5-fluorouracil or Cyclophosphamide, Epirubicin and 5-fluorouracil or 5-fluorouracil, Adriamycin and Cyclophosphamide or 5-fluorouracil, Epirubicin and Cyclophosphamide 6 cycles	32	37.6				
Adriamycin and cyclophosphamide 4 cycles plus Docetaxel 4 cycles	18	21.2				
Cyclophosphamide, Epirubicin and 5-fluorouracil or 5-fluorouracil, Epirubicin and Cyclophosphamide 3 cycles plus Docetaxel 3 cycles	8	9.4				
Others	21	24.7				
Chemotherapy cycle (M = 3.90, SD= 1.65, median= 4.00, Range = 2-8)						
2nd cycle	23	27.1				
3rd cycle	19	22.4				
4th cycle	9	10.6				
5th cycle	18	21.2				
6th cycle	11	12.9				
7th cycle	3	3.5				
8th cycle	2	2.4				
Comorbidity						
Yes	20	23.5	33.52	23.49	-2.018	0.044 ^m
No	65	76.5	35.89	22.48		

SD, Standard deviation, ^a, ANOVA; ^m, Mann Whitney U Test; r, Pearson product moment correlation coefficient; BCS, breast conserving surgery; MRM, modified radical mastectomy; ALND, axillary lymph node dissection

Table 3. Quality of Life Profiles Overall Health, Functions and Symptoms/Items among the Participants (n = 85)

EORTC QLQ-C30 variables	Items	Good		Moderate		Poor		Actual Range	Mean	SD
		66.7-100		33.4-66.6		0-33.3				
		N	%	N	%	N	%			
Overall quality of life	1	12	14.1	20	23.5	53	62.4	0-100	33.52	23.49
Overall health	1	17	20.0	27	31.8	41	48.2	0-100	39.6	22.85
Functional scales										
Physical functioning	5	51	60.0	28	32.9	6	7.1	20-100	66.28	19.24
Role functioning	2	48	56.5	6	7.1	31	36.5	0-100	56.66	26.37
Emotional functioning	4	30	35.3	25	29.4	30	35.3	0-100	50.58	29.7
Cognitive functioning	2	75	88.2	5	5.9	5	5.9	0-100	82.15	22.53
Social functioning	2	14	16.5	13	15.3	58	68.2	0-100	35.88	23.64
Symptom Scales/items										
Fatigue	3	39	45.9	25	29.4	21	24.7	0-100	57.91	24.12
Pain	2	16	18.8	6	7.1	63	74.1	0-100	29.79	27.59
Nausea/vomiting	2			2	2.4	83	97.6	0-50	5.13	11.77
Dyspnea	1	19	22.4	-		66	77.6	0-100	28.62	30.05
Insomnia	1	39	45.9	-		46	54.1	0-100	43.13	38.08
Appetite loss	1	38	44.7	-		47	53.0	0-100	47.44	31.02
Constipation	1	15	17.6	-		70	82.4	0-100	18.82	28.84
Diarrhea	1	1	1.2	-		84	98.8	0-100	2.35	12.37
Financial difficulties	1	59	69.4	-		26	30.6	0-100	70.97	36.65

Higher score in overall health, QoL and functional scales indicates good health, QoL and healthy level of functioning respectively. Higher score on symptom scales represents higher symptomatology

strongly predict the QoL in women with breast cancer during treatment (Begum et al., 2016; Filazoglu and Griva, 2008; Phligbua et al., 2013; So et al., 2009; Yan et al., 2016; Zou et al., 2014). The poor QoL in this group of women may be the negative impact of more treatment-related symptoms including overall symptom severity, and poor social support.

Background factors (age, years of education) and other clinical factors (stage and type of past breast surgery) did not predict the QoL significantly in the present study. A number of previous studies also found that age (Alawadi and Ohaeri, 2009; Quinten et al., 2015), educational level (Zou et al., 2014), stage (Akin et al., 2008; Alawadi and Ohaeri, 2009; Ogce et al., 2007) and past surgery (Safaei et al., 2008) were not associated with QoL in women undergoing treatment for breast cancer. However, education was a strong predictor of QoL in Pakistani women (Saleha et al., 2010) who had undergone treatment for breast cancer. Most of the Nepalese women did not have formal education making the sample more homogenous which may hinder to detect the effect of education in QoL in the present study.

Our findings suggest that nurses should assess the existence of the symptoms, their severity and manage them using treatment guidelines to improve the QoL of women while receiving chemotherapy for breast cancer. Also, it is recommended that nurses should regularly evaluate them for the need for informational and emotional support and provide preventive and supportive services through support group. Additionally, our study findings suggest to examine the cultural, religious and health care system-related factors to examine their association with

QoL in this underserved population.

The results of the current study confirmed that overall symptom severity and social support were the significant predictors of the QoL in women with breast cancer during chemotherapy. However, the findings of the current study cannot be generalized to the population who have different personal, clinical, social and cultural characteristics from the participants in the current study since the study was done in women with primary breast cancer only during chemotherapy at tertiary settings in Kathmandu, Nepal. Further, a study should be conducted in a larger sample using standardized symptom assessment scales to identify other symptoms including overall symptom severity.

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References

- Aaronson NK, Ahmedzai S, Bergman B, et al (1993). The European organization for research and treatment of cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst*, **85**, 365-76.
- Akin S, Can G, Durna Z, Aydinler A (2008). The quality of life and self-efficacy of Turkish breast cancer patients undergoing chemotherapy. *Eur J Oncol Nurs*, **12**, 449-56.
- Alawadi SA, Ohaeri JU (2009). Health – related quality of life of Kuwaiti women with breast cancer: a comparative study using the EORTC quality of life questionnaire. *BMC Cancer*, **9**, 222.
- Bayram Z, Durna Z, Akin S (2014). Quality of life during chemotherapy and satisfaction with nursing care in Turkish breast cancer patients. *Eur J Cancer Care*, **23**, 675-84.
- Begum MSN, Petpichetchian W, Kitrungrote L (2016). Symptom experience and quality of life of patients with breast cancer receiving chemotherapy in Bangladesh. *Bangl J Med Sci*, **15**, 201-6.
- Bower JE (2008). Behavioral symptoms in breast cancer patients and survivors. Fatigue, insomnia, depression, and cognitive disturbance. *J Clin Oncol*, **26**, 768-77.
- Camp- Sorrel D (2011). Cancer nursing: Principles and practice. In “Chemotherapy toxicities and management” Eds Yabro CH, Wujcik D and Gobel BH. Jones and Bartlett publishers, Sudbury, Massachusetts, pp 459.
- Chauhan N, Haridas K, Poddar I, et al (2015). Comparative study of quality of life in breast cancer patients receiving two different chemotherapy regimens using European organization for research and treatment of cancer quality of life questionnaire-core 30 questionnaire module; for tolerability and safety. *Int J Basic Clin Pharmacol*, **4**, 664-72.
- Denewer A, Farouk O, Mostafa W, Elshamy K (2011). Social support and hope among Egyptian women with breast cancer after mastectomy. *Breast Cancer (Auckl)*, **5**, 93-103.
- EORTC quality of life department (2016). EORTC QLQ-C30. [online]. Available at <http://groups.eortc.be/qol/eortc-qlq-c30>.
- Faul F, Erdfelder E, Buchner A, Lang AG (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav Res Methods*, **41**, 1149-60.
- Fayers, PM (2001). Interpreting quality of life data. *Eur J Cancer*, **37**, 1331-4.
- Fayers PM, Aaronson NK, Bjordal K, et al (2001). EORTC QLQ-C30 scoring manual. 3rd edition. Brussels: Belgium. European organization for treatment and research of cancer.
- Fernandes AF, Cruz A, Moreira C, Santos MC, Silva T (2014). Social support provided to women undergoing breast cancer treatment: a study review. *Adv Breast Cancer Res*, **3**, 47-53.
- Filazoglu G, Griva K (2008). Coping and social support and health related quality of life in women with breast cancer in Turkey. *Psychol Health Med*, **13**, 559-73.
- Gavric Z (2015). Quality of life of women with breast cancer-emotional and social aspects. *Am J Cancer Prev*, **3**, 13-8.
- Kwan ML, Ergas IJ, Somkin CP, et al (2010). Quality of life among women recently diagnosed with invasive breast cancer: the pathways study. *Breast Cancer Res Treat*, **123**, 507-24.
- Lua PL, Salihah NZ, Mazlan N (2012). Nutritional status and health-related quality of life of breast cancer patients on chemotherapy. *Malays J Nutr*, **18**, 173-84.
- Luitel S (2001). The social world of Nepalese women. *Occas Paper Sociol Anthropol*, **7**, 101-14.
- Lôbo SA, Fernandes AFC, César de Almeida C, Carvalho CM, Sawada NO (2014). Quality of life in women with breast cancer undergoing chemotherapy. *Acta Paul Enferm*, **27**, 554-9.
- Manandhar S, Shrestha DK, Pimsurang K, Siri S, Suparp J (2014). Quality of life among breast cancer patients undergoing treatment in national cancer centers in Nepal. *Asian Pac J Cancer Prev*, **15**, 9753-7.
- Moser A, Stuck AE, Silliman RA, Ganz PA, Clough-Gorr KM (2012). The eight-item modified medical outcomes study social support survey: psychometric evaluation showed excellent performance. *J Clin Epidemiol*, **65**, 1107-6.
- Musarezaie A, Ghasemi TMG, Esfahani HN (2012). Investigation the quality of life and its relation with clinical and demographic characteristics in women with breast cancer under chemotherapy. *Int J Prev Med*, **3**, 853-9.
- Ogce F, Ozkan S, Baltalarli B (2007). Psychosocial stressors, social support and socio-demographic variables as determinants of quality of life of Turkish breast cancer patients. *Asian Pac J Cancer Prev*, **8**, 77-82.
- Pradhananga KK, Baral M, Shrestha B (2009). Multi-institution hospital-based cancer incidence data for Nepal-An initial report. *Asian Pac J Cancer Prev*, **10**, 259-62.
- PhligbuaW, Pongthavornkamol K, Knopf TM, et al (2013). Symptom clusters and quality of life in women with breast cancer receiving adjuvant chemotherapy. *Paci Rim Int J Nurs Res*, **17**, 249-67.
- Pun CB, Pradhananga K, Sibakoti B, Subedi K, Moore A (2015). Malignant neoplasm burden in Nepal - Data from the seven major cancer service hospitals for 2012. *Asian Pac J Cancer Prev*, **16**, 8659-63.
- Quinten C, Coens C, Ghislain I, et al (2015). The effects of age on health-related quality of life in cancer populations: a pooled analysis of randomized controlled trials using the European organization for research and treatment of cancer (EORTC) QLQ-C30 involving 6024 cancer patients. *Eur J Cancer*, **51**, 2808-19.
- Rossi L, Stevens D, Pierga JY, et al (2015). Impact of adjuvant chemotherapy on breast cancer survival: a real-world population. *PLoS One*, **10**, e0132853.
- Safae A, Moghimi-Dehkordi B, Zeighami B, Tabatabaee HR, Pourhoseingholi MA (2008). Predictors of quality of life in breast cancer patients under chemotherapy. *Indian J Cancer*, **45**, 107-11.
- Saleha SB, Shakeel A, Shumaila E, et al (2010). An assessment of quality of life in breast cancer patients using EORTC QLQ-C30/BR-23 questionnaire. *Iran J Cancer Prev*, **3**, 98-104.
- Shrestha JR, Shrestha A, Sapkota A, et al (2017). Social support, quality of life and mental health status in breast cancer patients. *Cancer Rep Rev*, **1**, 1-5.
- So WKW, Marsh G, Ling WM, et al (2009). The symptom cluster of fatigue, pain, anxiety and depression and the effect on the quality of life of women receiving treatment for breast cancer: a multicenter study. *Oncol Nurs Forum*, **36**, 205-14.
- SPSS Inc. (2009). PASW Statistics for windows, Version 18.0. Chicago.
- The RAND Corporation. (2016). Social support survey instrument scoring instructions. Accessed at July 22, 2016. Available at https://www.rand.org/health/surveys_tools/mos/social-support.html.
- Yan B, Yang LM, Hao LP, et al (2016). Determinants of quality of life for breast cancer patients in Shanghai, China. *PLoS One*, **11**, e0153714.
- Zhan L (1992). Quality of life: conceptual and measurement issues. *J Adv Nurs*, **17**, 795-800.
- Zou Z, Hu J, McCoy TP (2014). Quality of life among women with breast cancer living in Wuhan, China. *Int J Nurs Sci*, **1**, 79-88.