



## Determinants of Quality of Life in Women living with Breast Cancer in Southwest Nigeria

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### Authors' contributions

This work was carried out in collaboration among all authors. Author Oluwafunbi Opadola conceptualized the idea, wrote the first draft and analyzed the data. Author Omodele Opadola organized and coordinated the data collection and assisted with data analysis. Author SO interpreted the data, wrote the final manuscript and format for publication. Author OA proofread the paper and was involved in the data interpretation. All authors read and approved the final manuscript.

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### ABSTRACT

**Background:** The quality of life (QOL) among women with breast cancer is hampered in areas of social, emotional, and sexual functioning and this could persist even years after treatment. It is an important parameter for monitoring disease progression at the early stage. Hence, this study aimed to determine the factors associated with the overall quality of life among subjects living with breast cancer.

**Methods:** The study was a comparative cross-sectional design conducted among women with breast cancer attending the General Surgical Outpatient clinic of LAUTECH Teaching Hospital Ogbomoso and a comparison group of age-matched control. The instrument used include the World Health Organization Quality of Life-BREF and socio-demographic and clinical variable questionnaire in 240 interviewer-administered questionnaires. Data were analyzed using SPSS version 21. A *P*-value of less than 0.05 was taken as statistically significant. The predictors of overall QOL were analyzed using a binary logistic regression.

**Results:** All QOL domain scores were significantly higher among controls than in subjects with

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breast cancer.  $p$ -value = 0.001. Level of education and duration of diagnosis had a statistically significant association with the overall quality of life,  $P$ -value < 0.05. Respondents who attained a tertiary level of education were 0.040 times less likely to have a poor quality of life compared to respondents that were not educated ( $P$ -value= 0.038) and the odds of having a poor overall quality of life decreased with duration since diagnosis  $P$ -value= 0.049.

**Conclusion:** Our study shows that women with breast cancer experience a lower QOL, especially in the physical, psychological and social domains than women without the disease. Also, the level of education, employment and marital status, and duration since diagnosis were major factors influencing QOL. Assessment of QOL is an important metric that should be incorporated into the breast cancer treatment program.

*Keywords: Quality of life; breast cancer; Nigeria.*

## 1. INTRODUCTION

World Health Organization (WHO) defines Quality of Life (QOL) as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and concerning their goals, expectation, standards, and concerns [1]. QOL may be objective or subjective. While some studies have reported the QOL of a female cancer survivor to be similar to the general population, others have reported a higher QOL [2-4].

QOL among women with breast cancer is hampered in areas of social, emotional, and sexual functioning and this could persist even years after treatment [5]. QOL among women with breast cancer is an important parameter for monitoring disease progression in the early stage of the disease [6]. Some determinants of QOL among women with breast cancer have been identified. A systematic review of 82 studies on health-related QOL in breast cancer patients from 2008 to 2018 aimed at updating current knowledge on QOL in breast cancer patients reported factors such as types of QOL assessment tools, the modality of treatment, control of symptoms, psychological interviews, and physical activities influenced the QOL among women with breast cancer. This review however lumped up studies involving newly diagnosed breast cancer cases, those receiving treatment, and long-term survivors. There could have been differences in QOL in these categories of patients [7].

Another study reported that generalized body pains, being sad about their appearance, and sexual and body image problems impact negatively their QOL and that the overall QOL was significantly lower compared to those without breast cancer [8]. However, another study highlighted other factors that determine

QOL apart from the discomfort and emotional trauma of the disease. A study aimed to examine the relationship among socio-demographic characteristics, optimism, social support, illness-related factors, appraisal of illness, coping strategies, and QOL among Chinese women with breast cancer reported that being positive about the disease, adaptive coping strategy, and good social supports had a significant relationship with QOL [9].

The QOL of women with breast cancer has been shown to vary from one dimension to the other. In other words, some domains of QOL are more affected than others. Gavric et al in Bosnia reported that emotional and social domains were the most significantly affected domains of QOL [10]. Whereas a local study on health-related QOL and its determinants reported that the impairment in overall QOL was significant in physical, cognitive, and social domains [11]. This study however aimed to examine the predictors of QOL among women living with breast cancer in southwest Nigeria.

## 2. METHODOLOGY

### 2.1 Study Design

The study was a comparative cross-sectional study.

### 2.2 Study Population

Participants were women with breast cancer attending the General Surgery Outpatient clinic and a comparison group of age-matched women without a history of breast cancer attending the General Outpatient Unit of LAUTECH Teaching Hospital, Ogbomosho.

### 2.3 Sample Size

The sample size was calculated using the formula for comparing two groups by Wang et al.

[12]. Taking the Prevalence in the 2 comparison groups is 40.3% (local study) and 13.9% from previous similar studies [13,14]. After correcting for attrition at 90%, the minimum sample size was 69. Therefore, 69 questionnaires were administered to the women with breast cancer, and twice this number to the comparative group (1:2), making a final total sample size of 207. However, two hundred and forty questionnaires were distributed.

## 2.4 Study Instruments

### 2.4.1 The socio-demographic and clinical variable questionnaire

This is a self-defined questionnaire that inquires about socio-demographic variables. This includes; age, marital status, employment status, average income per month, educational status, and amounts spent on medications/treatment per month. Clinical variables include; the year of diagnosis, stage of the disease, treatment type, and duration of treatment, family history of breast cancer, alcohol, cigarette, use of contraceptives, previous history of depression, perceived social support, and body perception.

### 2.4.2 World Health Organization Quality of Life- BREF

Quality of life was assessed using the WHOQOL-Brief version, which is a 26-item self-administered questionnaire. It is a short version of the WHOQOL-100 scale [15]. It is available in different languages and has been used in various cultures, including Sub-Saharan Africa like Nigeria yielding comparable scores [16]. It is a reliable and valid instrument for assessing the quality of life in women with breast cancer. The WHOQOL-BREF is made up of domains (dimensions) and facets (sub-domains). It has four domains and twenty-six items that are scored on a 5-point Likert scale. The four domains are; Physical health (7 items), Psychological health (6 items), social relationship (3 items), and Environment (8 items). Domain scores are scaled in a positive direction (i.e. higher scores denote a higher quality of life). The mean score of items within each domain is used to calculate the domain score. The remaining two items assess individuals' overall rating of the quality of Life (QOL) and subjective satisfaction with health and are not included in the domains but are used to form one facet on overall QOL

and general health. Higher scores indicate better quality of life.

## 2.5 Technique

A systematic random sampling method was used in this study. After the vital signs had been checked, these women were addressed on the importance of the study, the procedure, and the benefits. The first respondent was randomly selected from the sampling frame for the day. Then subsequent respondents were recruited by a sampling interval of 2 in order of arrival. The selected respondents were taken to a convenient room and consent to participate in the study was sought individually. For each breast cancer patient, 2 women (age-matched of  $\pm 3$  years) were recruited for the comparison group (women without a history of breast cancer). The respondents in this group were run through a checklist of symptoms and signs of breast cancer according to the Centre for Disease Control (CDC).

## 2.6 Data Analysis

Data were analyzed using the statistical package for social sciences (SPSS version 21) computer software. The socio-demographic characteristics of respondents were presented using descriptive statistics percentages and frequencies. The mean and standard deviations were calculated for continuous variables. The raw scores for each domain of WHOQOL-BREF were converted to transformed scores ranging from 0-100. The raw score for the 2 facets; overall quality of life and general health satisfaction were also computed. Higher scores denote a higher quality of life. They are presented using descriptive statistics to determine the mean and standard deviation.

The confidence level for all the tests will be set at 95%. A *P-value* of less than 0.05 was taken as statistically significant. The predictors of overall QOL were analyzed using a binary logistic regression.

## 3. RESULTS

A total of 240 questionnaires were administered, and 222 questionnaires were retrieved which yielded a response rate of 93%. Of the 222 respondents, 70 were women with breast cancer while 152 were age-matched women with no breast cancer.

There were more respondents without breast cancer who were single (32.9%) compared to respondents with breast cancer (15.7%) while married respondents were more among respondents with breast cancer (70.0%) compared to the other group (61.2%), *P-value*= 0.022. There were more educated respondents among women without breast cancer. 60.5% of these respondents had a tertiary level of education compared to 42.9% among women with breast cancer, *P-value*= 0.014. There were more unemployed respondents among women without breast cancer (32.2%) than the other group (17.1%), *P-value*= 0.019.

Table 2 describes the clinical profile of women with breast cancer. Smoking and alcohol

consumption were reported in only one respondent (1.4%). Only 32(45.71%) of respondents reported the use of contraceptives. Very few (8.6%) of the respondents had a family history of breast cancer. Duration of breast cancer diagnosis ranged from 1 to 60 months with an average duration of 16 months. The majority (51.4%) had stage II breast cancer, followed by stage III (24.3%), stage I (20%), and IV (4.3%). The commonest mode of breast cancer treatment was a combination of surgery and chemotherapy (67.1%), followed by chemotherapy only (21.4%) while a combination of surgery, chemotherapy, and radiotherapy occurred in 2.9%.

**Table 1. Socio-Demographic Profile of Respondents**

Variables	Control (n = 152)	Cases (n = 70)	X <sup>2</sup>	Df	p-value
<b>Age (years)</b>					
20 – 29	34 (22.4)	16 (22.8)			
30 – 39	43 (28.3)	17 (24.3)			
40 – 49	35 (23.0)	19 (27.1)	0.8268	4	0.9348
50 – 59	22 (14.5)	9 (12.9)			
60 – 69	18 (11.8)	9 (12.9)			
<b>Mean ± SD</b>	38.3 ± 11.2	35.2 ± 8.6			
<b>Marital status</b>					
Single	50 (32.9)	11 (15.7)			
Married	92 (61.2)	49 (70.0)			
Divorced	3 (2.0)	2 (2.9)			
Separated	4 (2.6)	3 (4.3)	11.474	4	0.022*
Widow	2 (1.3)	5 (7.1)			
<b>Level of education</b>					
No education	8 (5.3)	12 (17.1)			
Primary	19 (12.5)	10 (14.3)			
Secondary	33 (21.7)	18 (25.7)			
Tertiary	92 (60.5)	27 (42.9)	10.682	3	0.014*
<b>Employment status</b>					
Employed	103 (67.8)	57 (82.9)			
Un-employed	49 (32.2)	12 (17.1)	5.480	1	0.019*
<b>Religion</b>					
Christianity	101 (67.3)	55 (78.6)			
Islam	50 (32.9)	15 (21.4)			
Others	1 (0.7)	0 (0.0)	3.615	2	0.164
<b>Average monthly income (naira)</b>					
Below 50,000	65 (42.8)	28 (40.0)			
50,000 – 99,000	21 (13.8)	9 (12.9)			
100,000 – 149,000	7 (4.6)	7 (10.0)			
150,000 – 199,000	2 (1.3)	0 (0.0)	6.048	4	0.196
200,000 and above	6 (3.9)	0 (0.0)			
No response	51 (33.6)	26 (37.1)			

X<sup>2</sup>: Chi-square statistics, df: the degree of freedom, p- value < 0.05 indicates significance

**Table 2. Clinical Parameters Among Women with Breast Cancer**

Variables	n (%)
<b>Smoke</b>	
Yes	1 (1.4)
No	69 (98.6)
<b>Alcohol</b>	
Yes	1 (1.4)
No	69 (98.6)
<b>Contraceptives</b>	
Yes	32 (45.71)
No	38 (54.29)
<b>Family history of breast cancer</b>	
Yes	6 (8.6)
No	64 (91.4)
<b>Years of diagnosis (Months)</b>	
Minimum	1
Maximum	60
Mean $\pm$ SD	16.8 $\pm$ 13.72
<b>Stage of disease</b>	
Stage 1	14 (20.0)
Stage 2	36 (51.4)
Stage 3	17 (24.3)
Stage 4	3 (4.3)
<b>Mode of treatment</b>	
Surgery	6 (8.6)
Chemotherapy	15 (21.4)
Surgery + Chemotherapy	47 (67.1)
Surgery + Chemotherapy + Radiotherapy	2 (2.9)

**Table 3. Comparison of QoL among subject and control**

Domain score	Women without breast cancer	Women with breast cancer	t-statistic	p-value
Mean $\pm$ SD				
Physical	63.5 $\pm$ 11.3	57.7 $\pm$ 12.2	3.513	0.001*
Psychological	69.4 $\pm$ 11.1	56.9 $\pm$ 13.9	7.157	0.001*
Social	61.3 $\pm$ 14.9	50.5 $\pm$ 15.5	4.919	0.001*
Environmental	58.9 $\pm$ 10.9	60.4 $\pm$ 10.1	-0.922	0.358

t: t statistic, p-value < 0.05 indicates significance

Shown in Table 3 is the distribution of domain scores. Physical domain scores were significantly higher among women who had no breast cancer (63.5  $\pm$  11.3) than in women who had breast cancer (57.7  $\pm$  12.2), t = 3.513, p-value = 0.001. Similarly, the mean psychological domain scores were significantly higher among women who had no breast cancer (69.4  $\pm$  11.1) compared to women who had breast cancer (56.9  $\pm$  13.9), P-value = 7.157, p = 0.001. Furthermore, the mean social domain scores were significantly higher among the women who had no breast cancer (61.3  $\pm$  14.9) than in respondents with breast cancer (50.5  $\pm$  15.5), t = 4.919, p-value = 0.001.

There were two significant findings; Level of education and duration of diagnosis had a significant impact on the likelihood of having a poor overall quality of life, P-value < 0.05. Respondents who attained a tertiary level of education were 0.040 times less likely to have a poor quality of life compared to respondents that were not educated, B = -3.209, OR = 0.040, P-value = 0.038. The odds of having a poor overall quality of life decrease with duration since diagnosis. The odds of having poor quality of life decreased by 0.933 for a unit increase in no of months since diagnosis, B = -0.07 OR = 0.933, P-value = 0.049 (Table 4).

**Table 4. Predictors of Quality of life among Women with Breasts Cancers**

Factors	B	p-value	Odds ratio	95% CI for OR
Age (years)				
20 – 29	-0.862	0.429	0.422	0.050 – 3.578
30 – 39	-0.461	0.750	0.631	0.037 – 10.666
40 – 49	-0.321	0.822	0.725	0.041 – 11.318
50 – 59	-0.300	0.811	0.741	0.028 – 10.125
60 -69				
Level of education				
No education	-0.908	0.623	0.403	0.011 – 5.017
Primary education	-1.452	0.346	0.234	0.011 – 4.789
Secondary education	-3.209	0.038*	0.040	0.002 – 0.837
Tertiary education				
Employment status				
Unemployed				
Employed	-0.082	0.955	0.921	0.051 – 6.590
Marital status				
Single				
Married	1.231	0.287	3.423	0.356 – 4.352
Divorce/Separated/Widowed	0.134	0.936	1.143	0.044 – 7.615
Religion				
Christianity				
Islam	-0.913	0.410	0.401	0.046 – 3.520
Monthly income (naira)				
Below 50,000				
50,000 – 99,000	0.338	0.763	1.402	0.155 – 12.654
100,000 and above	1.140	0.306	3.126	0.353 – 13.673
Duration since diagnosis	-0.070	0.049*	0.933	0.870 – 0.924
Mode of treatment				
Surgery				
Chemotherapy				
Chemotherapy +	-0.694	0.723	0.499	0.011 – 12.129
Surgery/Chemotherapy +	0.255	0.861	1.290	0.075 – 11.313
Surgery + radiotherapy				

Correctly classified cases: 80%, Omnibus coefficient; 36.484, df = 17, p-value < 0.001

\*p-value < 0.05 indicates significance, OR: Odds ratio, CI: Confidence interval

#### 4. DISCUSSION

The study assessed factors determining the overall QoL among 240 subjects living with breast cancer and age-matched controls with a response rate of 93%. The age range of women with breast cancer was 29-65 years. This is similar to a study among the same population in Turkey which reported the range of 27-67 years [17]. Comparing respondents with breast cancer with age-matched women without breast cancer, this study found that there were more educated and married women with breast cancer than the control. This was also reported in a similar study in Brazil by Ana et al. [14].

This study found that 75.7% of the respondents with breast cancer had stages II and III of the disease. A similar proportion was found in

studies done in Nigeria and Ethiopia where 76.6% and 81% were reported respectively [13,18]. However, a similar study in Italy by Andrea et al, found that about 50% of the women had stage I whereas 34% were in stage II and III [19]. The possible explanation for the larger proportion of advanced breast cancer cases in African countries might be due to late presentation and a dearth of facilities for early detection.

The impact of breast cancer on different spheres of life is shown in their quality of life. From our observations of the four domains assessed by WHOQOL-BREF, social has the lowest mean score. This implies that breast cancer is impacted more by social relationships than other areas. Jaiyesimi et al in their study reported that, compared to other areas of functioning, social

was the most affected [11]. Similarly, Zivana et al found that emotional and social domains scores were significantly lower [10]. The mean SD score found in the physical domain in this study is comparable to the score of 53.45+/-16.2 reported by Marco et al in the study of quality of life among breast cancer survivors for the same parameter using the same instrument [20].

This study found that sociodemographic factors such as employment, marital, and educational status influenced the quality of life of women with breast cancer. Respondents who were employed had a significantly higher quality of life in physical and psychological domains than those that were unemployed. While respondents who were married had significantly better social relationships than their single counterparts and those with a higher level of education had higher environmental domain scores.

In the same vein, two clinical parameters; the stage of cancer and years of diagnosis/treatment had an impact on the quality of life of these women. Respondents who had been diagnosed with breast cancer and had been on treatment for two years or more had a higher quality of life in all the domains of WHOQOL-BREF compare to respondents with less than two years duration. Women with localized cancer stage had higher scores in the physical domain than those who were in the latter stages. This finding is consistent with the result of a study by Gangane et al. who found that a lower level of education had a significant association with the environmental domain of quality of life. The reason could be that, compare to women with a low level of education, well-educated ones are more likely to understand the information about the disease, treatment, advice, and follow up thereby reducing the time spent during the consultation and this could ultimately encourage subsequent follow-up visits. This may also be associated with the possibility of the learned having more financial wherewithal and support to access the needed care compare to the less educated.

This study is in tandem with previous similar studies on the negative impact of unemployment, being unmarried, shorter duration of diagnosis/treatment, and advanced stage of cancer on different domains of quality of life [21-23]. A plausible reason for a higher quality of life seen in the married patient compared to the unmarried, especially in the social domain might be due to the moral and financial support they

received from their partners. Women who are employed could have a higher financial capacity to cope with the disease and treatment. This might reduce the psychological stress and the physical impairment resulting from the disease.

The duration of diagnosis and treatment of breast cancer has been shown to influence the quality of life. A study in Turkey reported that women with a longer duration of the disease had a better quality of life in areas of role functioning and social relationships [24]. Women with breast cancer might be faced initially with the fear of a shortened life span and the possibility of a higher chance of survival. Over time they tend to come to terms with the disease, learn to cope with it, and make the best use of the time life permits. Al-Naggar et al in a similar study in Yemen found that women with a lower histological grade or stage had a better quality of life [25].

Although this study was carried out in only one health institution in southwest Nigeria which could have been hoped to be done as a multi-regional study, however this will in anyway not limit the generalization of our findings.

## 5. CONCLUSION

Our study shows that women with breast cancer experience a lower QOL, especially in the physical, psychological and social domains than women without the disease. Also, the level of education, employment and marital status, and duration since diagnosis are major factors influencing QOL. Assessment of QOL is an important metric that should be incorporated into the breast cancer treatment program. Concerted efforts should be geared at educating and empowering women. Mobilization of social support and financial aid will go a long way in easing the burden associated with breast cancer and its treatment. There is a need to explore the emotional distress that may arise and address it accordingly.

## CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

Ethical clearance was obtained from the Ethical Research Committee of LAUTECH Teaching Hospital, Ogbomoso Oyo State Nigeria.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. WHO | WHOQOL: Measuring Quality of Life.
2. Awadalla AW, Ohaeri JU, Gholoum A, Khalid AO a, Hamad HM a, Jacob A. Factors associated with quality of life of outpatients with breast cancer and gynecologic cancers and their family caregivers: a controlled study. Vol. 7, BMC cancer. 2007;102.
3. Paskett E, Herndon 2nd J, Donohue K, Naughton M, Grubbs S, Pavy M, et al. Health-related quality of life in long-term breast cancer survivors: differences by adjuvant chemotherapy dose in Cancer and Leukemia Group B study 8541.. Cancer. 2009;115:1109–20.
4. The Long-Term Evolution of Quality of Life for Disease-Free Breast Cancer Survivors\_ A Comparative Study in Belgium\_ Journal of Psychosocial Oncology\_ Vol 24, No 3.
5. Holzner B, Kemmler G, Kopp M, Moschen R, Rd Schweigkofler H, Du Nser M, et al. Quality of Life in Breast Cancer Patients— Not Enough Attention for Long-Term Survivors? Vol. 42, Psychosomatics. 2001;117–23.
6. Velikova G, Awad N, Coles-Gale R, EP W, JM B, PJ S. The clinical value of quality of life assessment in oncology practice--a qualitative study of patient and physician views. Psycho-Oncology. 2008; 17:690-698 9p.
7. Health-related quality of life in breast cancer patients\_ review of reviews from 2008 to 2018 \_ Health and Quality of Life Outcomes \_ Full Text.
8. Avis NE, Crawford S, Manuel J. Quality of Life Among Younger Women With Breast Cancer. Vol., J. Clin. Oncol. 23:3322–30.
9. Zou Z, Hu J, McCoy TP. Quality of life among women with breast cancer living in Wuhan, China. Vol. 1, International Journal of Nursing Sciences. 2014;79–88.
10. Gavric Z, Vukovic Z. Assessment of Quality of Life among Women Aged 35-55 Suffering from Breast Cancer. Vol. 4, iMedPub Journals. 2016;64.
11. Jaiyesimi AO, Sofela EA, Rufai AA. Health related quality of life and its determinants in Nigerian breast cancer patients. Vol. 36, African journal of medicine and medical sciences. 2007;259–65.
12. Wang H, Chow SC. Sample Size Calculation for Comparing Proportions. In: Wiley Encyclopedia of Clinical Trials; 2007.
13. Popoola AO, Adewuya AO. Prevalence and correlates of depressive disorders in outpatients with breast cancer in Lagos, Nigeria. Psychooncology. 2012;21(6): 675–9.
14. Vin-Raviv N, TF A, Galea S, DH B. - Depression and Anxiety Disorders among Hospitalized Women with Breast Cancer.
15. Skevington SM, Lotfy M, O'Connell KA. The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial. Vol. 38, European Science Editing. 2012;35–7.
16. Issa BA, Baiyewu O. Quality of Life of Patients with Diabetes Mellitus in a Nigerian Teaching Hospital Quality of Life of Patients with Diabetes Mellitus in a Nigerian Teaching Hospital; 2014.
17. Gokgoz S, Sadikoglu G, Paksoy E, Guneytepe U, Ozcakir A, Bayram N, et al. Health Related Quality of Life among Breast Cancer Patients: a Study from Turkey. Glob J Health Sci. 2011;3(2).
18. Wondimagegnehu A, Abebe W, Abraha A, Teferra S. Depression and social support among breast cancer patients in Addis Ababa, Ethiopia. BMC Cancer. 2019;19(1).
19. Lipsett A, Barrett S, Haruna F, Mustian K, O'Donovan A. The impact of exercise during adjuvant radiotherapy for breast cancer on fatigue and quality of life: A systematic review and meta-analysis. Vol. 32, Breast. 2017:144–55.
20. Gomez SL, Gonzales FA, Shariff-Marco S, Dwyer LA, Nuru-Jeter A. Discrimination and quality of life among breast cancer survivors. Journal of Clinical Oncology. 2016;34(3\_suppl):250–250.
21. Akin S, Can G, Durna Z, Aydiner A. The quality of life and self-efficacy of Turkish breast cancer patients undergoing chemotherapy. European Journal of Oncology Nursing. 2008;12(5):449–56.
22. Cui Y, Shu XO, Gao Y, Cai H, Wen W, Ruan ZX, et al. The long-term impact of medical and socio-demographic factors on the quality of life of breast cancer survivors among Chinese women. Breast Cancer Res Treat. 2004;87(2):135–47.
23. Güner P, Isikhan V, Kömürçü S, Sunay II, Öztürk B, Arpacı F, et al.



- Quality of life and sociodemographic characteristics of patients with cancer in Turkey. *Oncol Nurs Forum*. 2006;33(6): 1171–6.
24. Gokgoz S, Sadikoglu G, Paksoy E, Guneytepe U, Ozcakil A, Bayram N, et al. Health Related Quality of Life among Breast Cancer Patients: a Study from Turkey. *Glob J Health Sci*. 2011;3(2).
25. Al-Naggar RA, Nagi NMS, Ali MMS, Almuasli M. Quality of life among breast cancer patients in Yemen. *Asian Pacific Journal of Cancer Prevention*. 2011;12(9): 2335–41.

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