

Quality of Life of Women Survived after Breast Cancer Surgery

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ABSTRACT

Introduction: Quality of life(QOL) is a complicated and multidimensional measure that affects the diagnosis and impact the treatment of a disease. QOL continuously impacts the daily lives and activities of patients with breast cancer during and after recovery. **The current study aimed to:** identify the relationship between bio socio-demographic characteristics and quality of life of women identify the relationship between bio socio-demographic characteristics and quality of life of women undergone surgery as a treatment for breast cancer. **Methodology:** a descriptive cross-sectional design was adopted. Data was collected by conducting home visits for 120 randomly elected adult women who had undergone breast surgery as a treatment for breast cancer. Bio-socio-demographic structured interview schedule, QLQ-C30 and QLQ-C23 were used for data collection. **Results:** there was significantly higher frequencies effect of marital status, tumor condition before surgery, client's activity and time period between diagnosis & surgery as predictors on QLQ-C30 ($p = <0.01$). While; education, family income, family housing and after surgery treatment had slight significance frequencies effect on QLQ-C30 ($p < 0.05$). significantly higher frequencies effect of family housing, tumor condition before surgery, activity level and time period between diagnosis & surgery as predictors on QLQ-C23 ($p = <0.01$). While; education, marital status and after surgery treatment has slight significance frequencies effect on QLQ-C23 ($p < 0.05$). But, occupation, breast cancer stage, after surgery medical problem and family history were not predicted by relation to QLQ-C23 ($p > 0.05$). **Conclusion:** The overall quality of life of the study participants was below average compared to international references. Functional and symptom scales were affected in women after surgery. There was significantly higher frequencies effect of demographic factors as marital status, education, family income, family housing and clinical characteristics as tumor condition before surgery, breast cancer stage, client's activity, time period between diagnosis & surgery and post-surgery treatment as predictors on QLQ-C30 and QLQ-C23. While, age, occupation, after surgery medical problem and family history were not predicted by relation to participants' quality of life. **Key words:** Breast cancer, quality of life, therapy impact, breast cancer survivals

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INTRODUCTION

Breast cancer is one of the most frequently occurring cancers that is more prevalent among women. It starts due to an uncontrollable growth of cells in the breast forming a tumor. Most frequently manifested by presence of a lump, pain, size change in the breast, and nipple discharge [1].

Globally, an estimated 25.2% of cancer cases and 14.7% of cancer-related deaths among women had been attributed to cancer of the breast [2]. Breast cancer has such a profound effect on the world because of its late diagnosis and in general due to the lack of knowledge and resources about the disease. Additionally, the survival rates tend to be lower in developing countries at less than 40% compared to 80% in their fully developed counterparts. Deaths due to breast cancer in developing countries account for 58% of all worldwide breast cancer related deaths [3]. In Egypt, cancer breast represents 18.9% of total cancer cases with an age-adjusted rate of 49.6 per 100,000 populations [4], [5].

Most women with breast cancer must undergo a surgery as part of their treatment. There are several types of surgeries for breast cancer patients that are done for differing reasons and depend on the situation of the certain case [6]. The two main types of surgeries to remove breast cancer are breast-conserving surgery and mastectomy. Breast conserving surgery is an operation in which breast tissue that contains the cancer is removed. This is done in order to maintain normal surrounding tissue while removing the cancer, but the size of the tumor and other factors must be considered [7]. Mastectomy surgery is carried out by removing the entire breast including all cancerous, normal and surrounding breast tissue. There are also many types of mastectomies, including a double mastectomy in which the patient will have both breasts removed [8].

After breast surgery, women experience a wide variety of physical and emotional disorders such as fear of recurrence and depression, which significantly impact women's psychological status. Most breast cancer patients suffer from the psychological distress due to reverse effects and lifelong bodily deformity. Breast cancer status is a separate contributing factor to the general psychopathological profile. Breast cancer patients should be given special counseling and care to relieve their psychological distress [9]. Studies have shown that depression may have about 56% prevalence rate after mastectomies. Other treatments, including surgical treatments and systemic therapies, also affect the women's quality of life [10].

The quality of life of women in both the short and long term is heavily impacted by breast cancer and the treatment that they undergo. In particular, women face personal issues with body image, and the consequences of a breast cancer surgery, such as "loss of a breast, surgical scarring, alopecia, and weight changes," that can all negatively impact QOL and body image for the patient [11]. QOL generally rests on separate fundamental material and psychological human needs. Specifically, an important component of QOL is health promotion and physical feelings for the patient. Despite the knowledge that there is a positive relationship between health and quality of life, QOL continues to be left out of consideration in clinical practices [12].

QOL is a complicated and multidimensional measure that affects the diagnosis and impacts the treatment of a disease. For the patient, QOL continuously impacts the daily lives and activities of patients with breast cancer during and after recovery. Only recently has quality of life become a factor in evaluating cancer therapies, it stands as important as the

biomedical criteria. Quality of life is used as a measure of outcome for oncology research, and several tools are used to measure the QOL for cancer patients. Now, clinical trials usually include QOL as a “secondary endpoint in phase III investigations” [13].

Numerous benefits are expected from investigating QOL of breast cancer patients including; the ability to provide individuals and health care providers with accurate expectations about the likely impact of therapies on general wellbeing and functioning, identifying common post-surgery problems, and identifying the most effective therapies and interventions [14], [15]. Moreover, QOL findings may improve health care providers’ ability to predict therapy response and survival time in certain contexts. Limited research has been conducted to evaluate quality of life of women survived after breast cancer surgery in Alexandria. Considering the increasing prevalence of breast cancer and its negative effect on QOL This study aimed to: Identify the relationship between bio sociodemographic characteristics and quality of life of women who have undergone surgery as a treatment for breast cancer.

Research question:

Is there a relationship between bio socio-demographic characteristics and quality of life of women undergone surgery as a treatment for breast cancer?

MATERIALS AND METHODS

Study Design:

A descriptive cross-sectional design was adopted.

Study Setting:

A contact information list for women undergone surgery as a treatment for Breast Cancer was collected from Ayadi Almostakbal (a non-

governmental non-profit oncology center in Alexandria). Clients were contacted by telephone, and home visits were performed for those who agreed voluntarily and willingly to participate in the study.

Study Subjects

A random sampling technique was used in this study. One hundred and twenty (120) adult women who had undergone breast surgery as a treatment for breast cancer were selected and included in the study. Excluding patient planned for Radio- or Chemotherapy, and patients with severe physical, cognitive, or psychiatric illnesses.

Sample size:

The estimated sample size was 115 breast cancer women, at confidence level 98% and precision rate at 0.05 by using the Steven equation, 2012. A total number of 120 subjects were invited to participate; the estimation compensates for dropouts.

While.

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2 \right) \right] + p(1-p) \right]}$$

P= 0.5

N= Total population

Z= Z value “1.96”

D= Standard Error

n= sample size

Data Collection methods & instruments

In this study two tools were used;

Tool 1: Bio-socio-demographic structured interview schedule. This tool consists of 2 parts,

developed by the researchers to collect data about the following information:

Part A- Socio-demographic data

It includes questions about; age, educational level, occupation, family income, crowding index, place of residence, marital status, and family housing.

Part B- Medical History

It includes questions about; medical and surgical history, health complaints and usage of medications during the 12-month period before the time of the study, assessment of weight, height, type of current medication or therapy.

Tool 2: Quality of life interview schedule, consists of 2 parts:

The Arabic version of the European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30 questionnaire and its breast cancer module (QLQ-BR23) were used to measure quality of life in this study.

Tool 2.A. (QLQ-C30) questionnaire is an instrument for the self-evaluation of health-related quality of life of patients with cancer (The Core Quality of Life Questionnaire of the European Organization for Research and Treatment of Cancer) (version 3.0) with 30 questions [16]. The questionnaire consists of five functional scales: physical functioning; role functioning; emotional functioning cognitive and social functioning; and nine symptoms scales: fatigue, nausea and vomiting, pain, dyspnea, insomnia, appetite loss, constipation, diarrhea, financial difficulties.

Tool 2.B. (QLQ-BR23) Quality of Life Questionnaire Breast Cancer with 23 questions. Those 23 questions organized into four functional scales (body image, sexual functioning, sexual enjoyment and future perspective) and four symptoms scales (systemic side effects, breast symptoms, arm symptoms and upset by hair loss) [17], [18].

For both questionnaires, a four-point response scale was used to assess each item concerning functions or symptoms, and a seven-point scale was used for global health status/ quality of life. Scores were linearly transformed into a score of 0–100 for processing according to the EORTC manual [17]. Higher scores for the functional and global health status/quality of life scales represented better function and quality of life. In contrast, higher scores indicated greater problems for the symptom scales [19].

Procedure

Preparatory phase: this phase included reviewing of literature related to breast cancer. This served to develop and prepare the study instruments for data collection. There is no ethics committee of human research; however, research committee at University of Alexandria approved the study proposal, methodology and instruments. In addition, required permission for data collection was obtained from the director of the center.

Content validity of the QLQ-C30, QLQ-BR23 tools was shown adequately through previous research study [9][20]. Cronbach's Alpha was carried out to test the reliability; results for the research tools (bio-sociodemographic tool, QLQ-C30, QLQ-BR23) were (0.822, 0.798 & 0.779, respectively) indicating that the tool was reliable. The research tools were piloted with a group of 10 patients to examine clarity and feasibility of the tools.

Home visits were done for study participants for the purpose of data collection the patients were given the option of completing the tools with or without assistance, and the illiterate patients chose to have the researchers read the questionnaires to them and record their responses. Furthermore, the patients were given the chance to ask any question related to the study. Data collection was conducted over a period of 3 months from the beginning of May to the end of July 2019.

Statistical Analysis

Data obtained from the study participants was revised, coded and entered using Personal Computer (PC). Computerized data entry and Statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 22. (SPSS Inc., Chicago, IL, USA) for Windows. Result was presented using descriptive statistics in the form of mean and S.D. For correlations; the Fisher exact test, Pearson's chi-square test, and linear regression model were used to investigate the relationship

between a scalar response and one or more explanatory variables.

RESULTS AND DISCUSSION

Table 1: shows that mean age of studied subjects was 52.2 ± 11.6 years and 38.3% of them had university education. Also, reveals that 60% of studied subjects were homemaker and 70.8% of them were married. Meanwhile, 57.5% of the studied subjects had enough family income and 63.3% of family housing was owned home.

Table 1: Distribution of the studied subjects related to their socio-demographic characteristics (N=120).

Socio-demographic characteristics		No.	%
Age (yrs)	Min	30	
	Max	95	
	Mean \pm SD	52.2 \pm 11.6	
Education	Middle & below	50	41.7
	Secondary	24	20.0
	University & above	46	38.3
Occupation	Home maker	72	60.0
	Manual	31	25.8
	Professional	2	1.7
	Retired	15	12.5
Marital status	Married	85	70.8
	Divorced	21	17.5
	Widow	13	10.8
	Single	1	0.8
Family income	Enough and save	18	15.0
	Enough	69	57.5
	Not enough	33	27.5
Family Housing	Owned	76	63.3
	Rent	44	36.7

Table 2: shows that 36.7% of the studied subjects were firstly stage, 79.2% of them suffered from topical tumor before surgery, and only 24.2% of them were fully active. Regarding time period between diagnosis and surgery,

82.5% of the studied subjects had less than 12 months. While, 48.3% of them were treated with radiation therapy, 36.7% had Chemotherapy and 62.5% were prescribed medication after surgery that was mainly hormonal medication in 68% of

them. Meanwhile, 69.2% of studied subjects suffered from other medical problems after surgery, in which 15.7% of them was Cancer.

Noting that 53.3% of the study subjects had family history for chronic illness that was Cancer in 45.3% of them.

Table 2: Distribution of the studied subjects related to their clinical characteristics

	Clinical characteristics	Number (N=120)	Percent
Breast cancer stage before surgery	First	44	36.7
	Second	41	34.2
	Third	23	19.2
	Fourth	12	10.0
Tumor condition before surgery	Topical	95	79.2
	Mobile	17	14.2
	Unknown	8	6.7
Client's activity level	Fully active	29	24.2
	Restricted activity except light work	58	48.3
	Self-care but not active	14	11.7
	Limited self-care and immobile	15	12.5
Time period between diagnosis and surgery	No self-care and immobile	4	3.3
	More than 12 months	21	17.5
	Less than 12 months	99	82.5
After surgery treatment	Chemotherapy	44	36.7
	Radiation	58	48.3
	Others	13	10.8
	No treatment	5	4.2
After surgery medication	Yes	75	62.5
	No	45	37.5
Medication type (N=75)	Hormonal	51	68.0
	Others	24	32.0
After surgery has other medical problem	Yes	83	69.2
	No	37	30.8
After surgery medical problem type (N=83)	Cancer	13	15.7
	Others	70	84.3
Family history for chronic illness	Yes	64	53.3
	No	56	46.7
Family history disease (N=64)	Cancer	29	45.3
	Others	35	54.7

Regarding QLQ-BR30, **Table 3** demonstrates that the mean score of physical function and emotional function was 53.5 ± 3.55 and 53.91 ± 3.64 , respectively. Also, depicts that the mean score of sleep disturbance and pain was 64.3 ± 1.06 and 58.13 ± 1.67 , respectively.

Considering QLQ-BR23, the table shows that the mean score of future perspective was

56.75 ± 1.08 . Also, reports mean score of side effect of treatment was 54.85 ± 4.47 and mean of hair loss was 54.75 ± 1.23 .

Table 3: Mean scores of quality of life of the studied subjects (N=120)

QLQ-C30	Mean	SD
Functional Scale*		
Physical functioning	53.54	3.55
Role functioning (work/family)	47.50	1.85
Emotional functioning	53.91	3.64
Cognitive functioning	47.40	1.49
Social functioning	47.30	1.86
Overall functional scale	49.93	2.48
Symptom scale**		
Fatigue	31.70	2.46
Nausea& vomiting	40.21	1.63
Pain	58.13	1.67
Dyspnea	50.83	0.98
Sleep disturbance	64.38	1.06
Appetite loss	46.67	0.99
Constipation	50.21	1.04
Diarrhea	38.03	0.79
Financial difficulties	39.79	0.91
Overall symptom scale	46.66	1.63
QLQ-BR23		
Functional Scale*		
Body image	50.05	3.822
Sexual functioning	37.29	1.296
Sexual enjoyment	39.5	0.827
Future perspectives	56.75	1.083
Symptom scale**		
Side effects of treatment	54.85	4.471
Breast symptoms	22.08	2.773
Arm symptoms	54.65	2.393
Hair loss	54.75	1.239

*Higher values reveal higher level of functioning and quality of life min:0, max: 100

**Higher values reveal greater severity of symptoms, min:0, max:100

Figure 1 shows that the mean score of overall functional scale was 49.93 ± 2.48 , while mean score of overall symptom scale was 46.66 ± 1.63 .

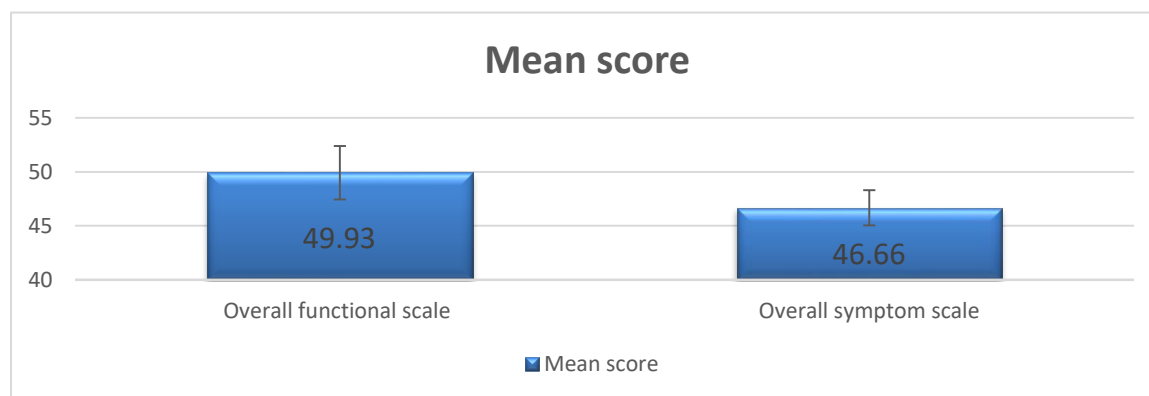


Figure 1: Mean scores of overall functional and symptom quality of life scales of the studied subjects (N=120).

Revealed by **Table (4)** that there was significantly higher frequencies effect of marital status, tumor condition before surgery, client's activity and time period between diagnosis & surgery as predictors on **QLQ-C30** ($p = <0.01$). While; education, family income, family housing and after surgery treatment

had slight significance frequencies effect on **QLQ-C30** ($p < 0.05$). But, occupation, breast cancer stage, after surgery medication and family history were not predicted by the relation to **QLQ-C30** ($p > 0.05$).

Table 4: Multiple Linear regression model for QLQ-C30

	Unstandardized Coefficients		standardized Coefficients		
	B		β	T	P. value
Age (yrs)	0.161		0.454	0.482	0.124
Education	0.108		0.154	3.825	0.031*
Occupation	0.240		0.317	1.407	0.084
Marital status	0.854		0.656	11.351	0.009**
Family income	0.502		0.708	8.300	0.015*
Family Housing	0.609		0.417	9.001	0.011*
Breast cancer stage before surgery	0.766		0.510	8.545	0.014*
Tumor condition before surgery	1.046		0.811	14.251	0.001**
Client's activity level	0.989		0.894	16.001	0.000**
Time period between diagnosis and surgery	0.861		.677	10.673	0.009**
After surgery treatment	0.561		0.464	8.612	0.018*
After surgery medication	0.263		0.279	3.414	0.051
After surgery medical problem	0.879		0.599	8.002	0.010*
Family history for chronic illness	0.116		0.210	0.945	0.312

a. Dependent Variable: **QLQ-C30** b. Predictors: (constant) **Demographic and clinical characteristics of study.**

Table 5 presents that there was significantly higher frequencies effect of family housing, tumor condition before surgery, activity level and time period between diagnosis & surgery as predictors on **QLQ-C23** ($p = <0.01$). While; education, marital

status and after surgery treatment has slight significance frequencies effect on **QLQ-C23** ($p < 0.05$). But, occupation, breast cancer stage, after surgery medical problem and family history were not predicted by relation to **QLQ-C23** ($p > 0.05$).

Table 5: Multiple Linear regression model for QLQ-C23

	Unstandardized Coefficients		standardized Coefficients		
	B		β	T	P. value
Age (yrs)	0.199		0.268	0.310	0.099
Education	0.205		0.223	4.813	0.025*
Occupation	0.155		0.287	2.001	0.068
Marital status	0.454		0.617	5.341	0.049*
Family income	0.094		0.114	2.015	0.062*
Family Housing	0.732		0.487	8.056	0.009**
Breast cancer stage before surgery	0.148		0.210	1.545	0.067
Tumor condition before surgery	1.101		0.769	13.688	0.002**
Client's activity level	0.994		0.712	13.208	0.003**
Time period between diagnosis and surgery	0.884		0.795	10.221	0.009**
Treatment after surgery	0.561		0.464	8.612	0.018*
Medication after surgery	0.455		0.448	5.414	0.049*
Medical problem after surgery	0.379		0.260	8.002	0.051
Family history for chronic illness	0.120		0.194	1.218	0.187

a. Dependent Variable: **QLQ-C23** b. Predictors: (constant) **Demographic and clinical characteristics of study.**

DISCUSSION

Women's breasts have physiological functions, in addition to symbolizing women's femininity, sexuality, motherhood, and attractiveness. In this respect, breast cancer and its management severely affects a women's somatic health, quality of life, sexuality, and perception of body image [21]. Regardless the revolutionary advances made in the diagnosis and management of all oncologic ailments, breast cancer still affects the highest percent of cancer patients, and its survivors experience various problems that drastically impact their quality of life [22]. Investigating the quality of life in women with breast cancer is expected to result in identifying new methods to optimize the therapeutic modalities, outcomes, and rehabilitation for

patients. The findings from this study provide further insight into the relationship between bio-socio-demographic characteristics and the quality of life of women who have undergone surgery as a treatment for breast cancer.

Current study findings depicted that the mean score of overall QOL for the study participants is lower than the results presented in previous studies performed in Turkey and Morocco [22], [26]. Additionally, it showed lower mean scores for global and most subscales than the EORTC QLQ reference value manual for breast cancer patients (61.8 ± 24.6) proving poor QOL of the study participants [27]. However, it should be mentioned that the reference value manual was based only on pretreatment QOL data, so poor

QOL of this study participants may be a result of side effects due to different treatments that most patients experienced, including surgery, radiotherapy, and chemotherapy.

Conflicting results were reported about the influence of demographic variables, such as age, educational and occupational status, on the quality of life of breast cancer survivors. Specifically, the mean age of the current study participants showed coherence with the mean age of patients in a study by Lavdaniti et al., 2019 [28]. However, the age of this study participants did not impact their quality of life, and this result was supported by studies done by Daldoul et al., 2018 and Tsai et al., 2017 [29], [30]. Contradicting the results of an earlier study by Chu et al., 2016 [31].

Concerning education, results of the current study reveals that participants' education was significantly correlated with QOL, which came in accordance with previous studies that presented better QOL associated with higher educational levels [24], [25], [32]. Based on these results, it can be assumed that people with higher educational levels might have more opportunities for employment, more access to economic resources, and better quality of health care. Nevertheless, few studies done in Turkey have contradicted these results, reporting that educational level did not affect the quality of life in their study participants [33], [34]

Despite the low mean score for role, cognitive, and social functioning subscales in the current study, quality of life parameters, namely marital status, family income, and housing conditions, proved to significantly affect the QOL of the study participants, recognizing that the majority of this study participants were married. This result was coherent with a study in Turkey, documenting that single patients had worse general well-being than married ones. In addition, results of other studies from different

countries indicated that married participants showed better quality of life due to more social interaction, support by close relatives and friends, and a sense of self control which improved their QOL [33], [35].

On the other hand, the current study results showed a non-significant effect of occupation on QOL of the study participants, contradicting the findings of Stündag & Zencirci, 2015, which reported worse physical and social wellbeing for housewives than other occupations [33]. However, both family income and family housing in this study significantly affected participants' QOL. It is well established that psychological distress is linked to clients experiencing economic hardship [24].

Regarding clinical characteristics, the stage of cancer is considered an important factor in planning therapy, management and support. Current study results demonstrated that more than one quarter of the participants had third or fourth stage breast cancer, and this significantly affected their QLQ-C30. This finding is coherent with previous studies that have reported negative effect of a greater cancer stage on quality of life and its dimensions (Ivanauskiene et al, 2010 & Lidgren et al, 2007) [36], [37]. It is worth saying that, more than three quarters of the current study participants had a topical tumor, showing significantly higher frequencies effect as a predictor on both QLQ-C30 and QLQ-C23.

Various studies have shown the benefits of physical or psycho-educational care during and following breast cancer treatments [38], [39]. Despite the highest score being given to the physical and emotional functioning subscales compared to the role, cognitive, and social functioning subscales in this study, current results depicted that almost one quarter only of the study participants were fully active, and physical activity noted high significant associations with QOL. This contradicts the

findings of a Moroccan study presenting lower scores for physical and role functioning and higher scores for cognitive and social functioning [40].

In relation to the symptom scale, sleep disturbance, pain, constipation, and dyspnea constituted the most frequently reported symptoms that affected study participants. Similar result was reported by El Fakir et al., 2016 [40], differing in that fatigue was among the most severe symptoms in their study but was the lowest reported symptom in the current study. This may be due to the nature of this study population, who had been interviewed during a time period post therapy. This conclusion is supported by a high statistically significant association between time period between diagnosis and surgery and QOL in the multiple linear regression model for both QLQ-C30 and QLQ-C23. Leclerc et al., 2018 noted similar result of marked improvement of the state of fatigue [41].

It is worth noting that almost one third of the study participants had taken chemotherapy, nearly half of them had radiotherapy, and almost two thirds of the participants were on post-surgery medication, which was mostly hormonal. These results showed significant association with QOL of the current study participants, taking into consideration that most QOL subscales scored lower than previous studies. These findings came consistent with the findings of Daldoul, et al., 2018 [29], but are inconsistent with previous studies that reported hormone therapy proceeding surgery and chemotherapy seemed to be associated with better QOL [28], [42].

Finally, there were conflicting results about scores on functioning scales (body image, sexual functioning, sexual enjoyment, future perspectives) and breast symptoms. The current study found results that came lower than those

reported by previous studies, but scores of symptoms scales (side effect of treatment, arm symptoms, hair loss) were better than those reported previously [29], [43]. It can be assumed that cultural factors might have affected the results of the current study and could be considered for studying in future research.

CONCLUSIONS

The overall quality of life of the study participants was below average compared to international references. Both demographic and clinical characteristics of study participants significantly impacted their quality of life. Functional and symptom scales were affected in women after surgery. There was significantly higher frequencies effect of demographic factors as marital status, education, family income, family housing and clinical characteristics as tumor condition before surgery, breast cancer stage, client's activity, time period between diagnosis & surgery and post-surgery treatment as predictors on QLQ-C30 and QLQ-C23. While, age, occupation, after surgery medical problem and family history were not predicted by relation to participants' quality of life.

Recommendations

According to the results of the current study, the following recommendations are suggested:

Our findings highlight the need for additional research about the quality of life of women with breast cancer with increasing sample size and different settings. An intervention research about the effect of an educational program for breast cancer patients on their quality of life is also needed. Findings also encourage nurses' professional sensitivity for identifying high-risk women, and present important information for planning and prioritizing management strategies for patients' rehabilitation.

The preparation of educational program for female breast cancer patients about improving their quality of life should be implemented. Continuous and mandatory in-service training for nurses who provide care for breast cancer patients about enhancing quality of life is a necessity.

Study limitations

Quality of life of the study participants was determined at a single point of time, and it was not compared across several time intervals. In addition to participant's election method, they were chosen from a single setting, which might have resulted in having a study sample exposed to the same method of treatment and management. Those limitations might be studied in future bigger surveillance.

Despite those weaknesses, this study is the only study that data collection was done through home visits to ensure healthy mindset and familiar surroundings during the study for participants in order to provide insight of health related QoL over time.

Ethics approval and consent to participate

The research committee at University of Alexandria approved the study proposal, methodology and instruments. In addition, required permission for data collection was obtained from the director of the center.

Participants' informed consent was secured. The participants' rights were protected by explaining to them the purpose and significance of the study and their role in the study. Participants were reassured that their responses will be kept anonymous, and no remarks will be made to identify their identity. Each client was informed that her participation in the study is voluntary and she can withdraw at any time, and that her withdrawal will not affect the care she receives at the center.

Data was coded, and the completed questionnaires were kept in a locked cabinet till the end of the study and would be destroyed after study publication. A private computer with password was used for data analysis and management.

Conflicts of Interest

The authors declares that there is no conflict of interest regarding the publication of this paper.

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