RESEARCH ARTICLE

Quality of Life and Psychological Wellbeing of Breast Cancer Survivors in the Kingdom of Saudi Arabia

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Abstract

Introduction: Breast cancer is the most common cancer among Saudi population. Breast cancer patients suffer from several negative consequences after treatment and these include pain, fatigue, sexual problems, appearance and body image concerns, with psychological dysfunction. This could affect the patient quality of life and psychological well-being. **Methods:** a multicenter cross-sectional study to assess quality of life and psychological wellbeing and their predictors for female breast cancers survivors diagnosed between 1 January 2015 and May 2017 with the assessment conducted at 12 to 36 months after initial diagnosis. Assessment was performed using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), the Breast Module (QLQ-BR23) and the Hospital Anxiety and Depression Scale (HADS). **Results:** 246 Breast cancer patients participated in the study with a mean age of 49.5 ± 10.9. The mean global health status has a mean of 72.7 ± 23.5. The worst domain of the functioning scales was physical functioning (mean score of 62.14 ± 26.03, while the best scores were for social functioning of 80.06 ± 29.18. For the symptom scales, the worst scores were reported for fatigue and pain. Results of HADS scale showed that 57% had moderate to severe depression, while 44% had moderate to severe anxiety. Only 6.8% of the participants reported receiving psychosocial support. **Discussion:** Breast cancer survivors in the KSA have overall good quality of life scores when compared with patients from Western countries. However, their psychological wellbeing is more impaired. There is an urgent need for psychosocial support programs and psychological screening and consultation for breast cancer patients at cancer care centers in the KSA.

Keywords: Breast cancer- quality of life- psychological wellbeing- Saudi Arabia

Introduction

Breast cancer is the most common cancer among females worldwide. Breast cancer patients suffer from several negative consequences after breast cancer complications or treatmesnt and these include pain, fatigue, sexual problems, appearance and body image concerns, with psychological dysfunction. This could affect the patient quality of life and psychological well-being (Mokhatri-Hesari and Montazeri, 2020).

Breast cancer treatment could include different therapies like partial or total mastectomy, radiotherapy, and chemotherapy with or without systemic hormonal therapy, depending on stage and estrogen receptor status at diagnosis. This is associated with short- and long-term complications such as pain, lymphedema, reduced vaginal lubrication, and hot flashes due to long-term hormonal therapy (Armitage, 2002).

Breast cancer is the commonest cancer in Saudi Arabia (KSA), with a dramatic increase in its incidence over the last 15 years. It is the second leading cause of death in the KSA (Abulkhair et al., 2010; El Hag et al., 2002; Ibrahim et al., 2008). Data from the Saudi Cancer Registry shows that breast cancer accounts for 29% of all newly diagnosed female cancers (n=3954) in 2020, with an age-standardized incidence rate (ASR) of 28.8 per 100,000 for the female population (Who, 2018).

Saudi Arabia has witnessed significant success in

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cancer care during the last decade. Cancer care has improved dramatically, aiming to achieve comprehensive care for cancer patients in Saudi Arabia. This has improved breast cancer survival rates in the KSA. Several studies were conducted in the KSA on quality of life and showed large differences in score from low to a good overall score (Almutairi et al., 2016; Imran et al., 2019). The main limitations for these studies that there were conducted at one center or they included all patients regardless of time since diagnosis without differentiation between quality of life for patients were newly diagnosed, intermediate survivors, or long-term survivors.

A cross sectional study from one cancer center in Jeddah using (EORTC QLQ-C30 and BR23) showed a good quality of life scores and identified areas that need further support, such fatigue, insomnia, hair loss (Imran et al., 2019). Another study was in Riyadh, Saudi Arabia, on breast cancer survivors showed a low overall global quality of life(Almutairi et al., 2016).

Intermediate survivors who completed their main treatment regimen could suffer from different quality of life and psychological impairments, and this could go unnoticed if the focus is on the clinical points (Mokhatri-Hesari and Montazeri, 2020). It was planned to conduct a multicenter national study to assess the quality of life and psychological wellbeing and their predictors for intermediate survivors in the KSA. This would allow assessing intermediate consequences of breast cancer like pain and fatigue, sexual problems, appearance, body-image concerns, and psychological dysfunction. This study was not looking, therefore, for immediate post-treatment effects of breast cancer management.

Materials and Methods

Study Design

This project was a cross-sectional study on female breast patients diagnosed between 1 January 2015 and May 2017; therefore, the assessment was 12 to 36 months after initial diagnosis.

This study was conducted in three KSA regions between Central, Eastern, and Western. Research sites include two large tertiary Ministry of Health Hospitals and two National Guard Health Affairs hospitals. These centers manage around one third to half of cancer patients in the KSA. The sample, therefore, represents female breast cancer survivors in the KSA to a large extent. Research coordinators explained the aims and objectives of the study to potential participants and consented those who agreed to participate. Participants were also consented to review their medical profile.

Eligibility Criteria

Inclusion criteria:
- Female breast cancer patients 6-12 months postdiagnosis
- Age range 18 to 65
- Lives permanently in the KSA
- No history of other cancers
- Not receiving current therapy for a minimum of six months prior to recruitment except tamoxifen or

Aromatase inhibitors including anastrozole (Arimidex), exemestane (Aromasin), and letrozole (Femara)

Exclusion criteria
- Inability to attend the interview
- Have a medical condition that limits her ability to complete interview

Study Outcomes
Primary endpoints
1. Health-related Quality of life scores using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and the Breast module (QLQ-BR23).

The Arabic versions of the European Organization for Research and Treatment of Cancer (EORTC QLQ-C30) general quality of life questionnaire (QLQ-C30) and the breast cancer–specific questionnaire (QLQ-BR23) was validated on breast cancers patients in the United Arab Emirates (Awad et al., 2008) and Kuwait (Alawadi and Ohaeri, 2009). These two studies showed that the Arabic versions of the EORTC QLQ-C30 and QLQ-BR23 are reliable and valid tools for assessing the quality of life in Arab patients with breast cancer (Alawadi and Ohaeri, 2009; Awad et al., 2008).

The functioning domains higher scores mean better quality of life, while the higher scores for the symptoms mean the worse quality of life.

Secondary endpoints

Anxiety and depression levels using The Hospital Anxiety and Depression Scale (HADS). This scale is a validated screening instrument for anxiety and depression that has been validated in different settings for the general population and patients with a wide range of medical conditions. A score of 0 to 7 is categorized as normal, a score of 8 to 10 suggests possible anxiety or depressive disorder, and a score of 11 or above indicates probable anxiety or depressive disorder (Zigmond and Snaith, 1983).

This questionnaire was validated on Arab patients (El-Rufaie and Absood, 1987), including breast cancer patients (Alawadi and Ohaeri, 2009).

Predictors of quality of life

Several demographic and medical factors that could predict quality of life scores were collected in this study. Their effect on quality of life scores was evaluated in the regression analysis.
- Sociodemographic variables (age, age at diagnosis, time since last treatment, marital status, living status, average monthly household income, medical insurance, job, husband's job, education, husband's education, smoking status
- Medical history, cancer treatment and diagnosis information: stage, grade, morphology, treatment including categories for surgical treatment (breast conserving therapy, mastectomy with and without reconstruction), systemic adjuvant therapy (chemotherapy, hormonal therapy), and radiation therapy. Menopausal status, other comorbidities, medication history, family

history of cancer.

Eligible participants were interviewed alone by a female doctor or research assistant unless they preferred to be accompanied by a friend or family member. Participants were free not to answer any question or to withdraw from the interview without being questioned. Research assistants were instructed to thank the withdrawals for their time and for taking part in the survey. For illiterate patients, a third party such as a family member of a friend of the participant must be available when consenting

Research Ethics Committee Approval

Ethical approvals were obtained from the Ethics Committee of the Ministry of National Guard Health Affairs through King Abdullah International Medical Research Office. All participants signed an informed consent form prior to being interviewed.

Sample size calculation and data analysis

According to Kish formula (1965) for survey sampling (Al-Subaihi, 2003), the estimated sample size of 240 (MoH, 2014). This is the largest sample size based on the assumption above, along with 5% of margin of error.

Plan for statistical analysis

Analysis was conducted using STATA 10 software. As shown in the study outcomes section, in addition to the calculation of quality-of-life scores, data on predictors of quality-of-life scores or confounding factors was collected through a standardized questionnaire and clinical form. These two forms covered sociodemographic variables, pathology, stage, grade treatment, other medical conditions.

Student's t tests was used to compare means of continuous variables for two groups, and one-way analysis of variance was used to compare means of continuous variables for three or more groups. For data that does not follow a Gaussian distribution, nonparametric tests were used (Bland, 2002).

Pearson correlation coefficients were used for investigating the relationship between two quantitative continuous variables. Chi-square tests were used to compare categorical measures, and a one-way analysis of variance was used to compare means of continuous measures across the groups. For the analyses that involved adjusting for covariates, forward stepwise logistic regression was used for dichotomous outcomes, and analysis of covariance will be used for continuous outcomes (Bland, 2002).

Results

This cross-sectional study included 246 Breast cancer patients with a mean age of 49.5±10.9.

The mean age at diagnosis was 46.0±11. 4% of the participants were smokers. 57.8% had left side breast cancer, 41.0% had right sided breast cancer, while 1.3% had bilateral breast cancer.

Supplementary Table 1 shows selected sociodemographic characteristics of study participants. They were well distributed in regions in the KSA. Most

of the participants were married, and 20% of them could not read and write. Only one quarter of participants were on full time employment. 88% of the participants reported that they did not have financial constraints due to cancer diagnosis.

Table 1 shows selected clinical indicators for the study participants. Most of the patients had a mastectomy, while around one third had a lumpectomy. 10% of the patients had distant metastasis, while 31.3% had regional metastasis.

Quality of life scores

Table 2 shows the quality of life scores using QLQ-C30

Table 1. Clinical Indicators of the 246 Female Breast Cancer Participants

Type of surgery	Lumpectomy	73	29.8
	Mastectomy (No re-const)	161	65.5
	Mastectomy (Re-const)	12	4.7
Surgical margin	Negative	210	85.4
	Positive	36	14.6
Had axillary dissection	No	97	39.3
	Yes	149	60.7
Adjuvant Chemotherapy therapy	No	52	21.2
	Yes	194	78.9
Radiation therapy	No	92	37.2
	Yes	154	62.8
Trastuzumab (Herceptin)	No	148	66.4
	Yes	75	33.6
Used tamoxifen	Currently	75	33.2
	Never	128	56.6
	Previously	23	10.2
		20	
Aromatase inhibitors	Currently	37	16.4
	Never	174	77.3
	Previously	14	6.2
		21	
Received any of the followings: anastrozole (Arimidex), exemestane (Aromasin), and letrozole (Femara)	No	122	80.8
	Yes	29	19.2
		95	
Treatment received	Exemestane	4	7.7
	Letrozole	48	92.3
		194	
Recurrence since baseline	No		95.0
	Yes		5.0
Extent of disease	Distant metastasis	25	10.1
	Local	144	58.6
	Regional	77	31.3
Axillary Lymph nodes	more than 3	45	18.2
	None	121	49.3
	one	52	21.2
	two - three	28	11.3
Oestrogen Receptors status	Negative	13	5.3
	Positive	226	91.7
	Unknown	8	3.1

Table 2. QLQ-C30 Questionnaire Scores

Scale	Mean	Standard deviation	Percent less than 33.3%	Percent more than 66.7%
Global health status				
Global health status/QoL (QL2)	72.71	23.54	5.5	60.55
Functional scales				
Physical functioning (PF2)	62.14	26.03	11.93	40.37
Role functioning (RF2)	78.69	29.60	7.69	62.5
Emotional functioning (EF)	75.39	26.81	8.41	65.42
Cognitive functioning (CF)	74.61	25.53	5.61	58.88
Social functioning (SF)	80.06	29.18	6.54	62.62
Symptom scales				
Fatigue (FA)	28.29	25.67	55.96	8.26
Nausea and vomiting (NV)	10.86	22.61	79.82	2.75
Pain (PA)	27.52	28.00	57.80	9.17
Dyspnoea (DY)	19.44	27.77	58.33	5.56
Insomnia (SL)	25.99	34.35	55.05	11.01
Appetite loss (AP)	14.51	25.89	70.37	3.70
Constipation (CO)	14.98	28.50	71.56	7.34
Diarrhea (DI)	7.41	18.97	83.33	1.85
Financial difficulties (FI)	7.55	20.72	85.85	1.89

scores. The mean global health status has a mean of 72.7±23.5. The worst domain of the functioning scales was physical functioning (mean score of 62.14±26.03, while the best scores were for social functioning of 80.06±29.18. For the symptom scales, the worst scores were reported for fatigue and pain.

Table 3 shows results on the QLQ-BR-23 that is the breast module. The worst scores were for a future perspective domain with a mean score (51.41±38.81). On the symptom scales, the worst score was reported for Upset by hair loss by mean of 54.52±41.00.

Figure 1 showed results of Hospital Anxiety and Depression scales (HADS) for the 246 participants. It shows that 57% had moderate to severe depression, while 44% had moderate to severe anxiety.

Only 6.8% of the participants reported receiving psychosocial support

Predictors of Global Scores: regression analysis showed that age of diagnosis, marital status, participated in any psychological program, and HADS depression scores were statistically significant predictors of the global quality of life scores (P<0.05).

Not owning place of residence and having financial constraints were statistically significant predictors of the anxiety scale of HADS; while living in a rural area, the presence of chronic diseases and tumor size of 2cm or more were statistically significante predictors of higher depression scores.

Discussion

This study showed a good quality of life and psychological wellbeing of intermediate breast cancer survivors in different regions in the Kingdom of Saudi Arabia. The global score of QLQ-C30 (72.71±23.54 SD) was slightly higher than regional and international figures. A study from a large Ministry of Health Cancer Unit from Jordan reported a global score of 63.7±20.2 among breast cancers survivors on the intermediate term,

Table 3. BR-23 Module Scores

Scale	Mean	Standard deviation	Percent less than 33.3%	Percent more than 66.7%
Functional scales				
Body Image (BRBI)	64.09	30.87	12.18	46.64
Sexual functioning (BRSEF)	70.92	30.09	6.25	47.92
Sexual enjoyment (BRSEE)	69.91	34.88	10.39	49.35
Future perspective (BRFU)	51.41	38.81	25.00	30.08
Symptom scales				
Systematic therapy side effects (BRST)	38.59	27.23	43.44	17.21
Breast symptoms (BRBS)	33.62	24.45	44.59	3.90
Arm symptoms (BRAS)	40.39	27.12	27.39	10.43
Upset by hair loss (BRHL)	54.52	40.96	27.09	36.45

Table 4. Hospital Anxiety and Depression Scores (HADS)

Factor	Category	Frequency	Percent	Valid Percent
HADS Depression Score	Low	107	43.50	43.50
	Moderate	72	29.27	29.27
	High	67	27.24	27.24
HADS Anxiety Score	Low	139	56.50	56.50
	Moderate	60	24.39	24.39
	High	47	19.11	19.11

similar to this study timeline (Abu-Helalah et al., 2014). Also, the results are reported from another gulf country of Bahrain with global scores of 63.9±21.3 SD) (Jassim and Whitford, 2013) and from Germany (65.5±22.2 SD) (Waldmann et al., 2007).

Physical functioning had the lowest mean score (62.14±26.03SD) within the functional scales for the QLQ-C30, and social functioning had the highest mean score (80.06% ±29.18 SD). This score was close to scores reported in KSA (63.61± 26.85SD) (Imran et al., 2019) and (79.63%± 27.15SD) respectively, but lower than scores reported in Bahrain (mean=74.9±21.7 SD) for physical functioning (Jassim and Whitford, 2013), and much lower than reported from Germany (mean=93.2±6.8 SD) (Waldmann et al., 2007). The remaining scores of QLQ-C30 functional scales were close to those reported in the KSA study (Imran et al., 2019).

The study participants' mean age of 49.54 years is similar to the mean age in the Bahraini study and KSA study (Imran et al., 2019; Jassim and Whitford, 2013).

The worst scores among the QLQ-C30 symptoms were for fatigue (mean=28.29±25.67 SD), with 8.26% of the participants scoring more than 66.7%. This was followed by pain (mean=27.52±28 SD), with 9.17 % of participants scoring more than 66.7%. These results are close to regional and international figures. In a longitudinal study, it was seen that depression, fatigue, and sleep disturbance were expressed as a symptom cluster. So, interventions targeting fatigue might be helpful in combating psychological issues (Ho et al., 2015). Similar results were not found in our study. Participants in our study might have had other worries than fatigue, such as fear of death or financial worries, which could have affected their psychological wellbeing more than fatigue or physical functioning. There is no difference in the prevalence of fatigue between our sample and the published figures(Almutairi et al., 2016; Jassim and Whitford, 2013; Waldmann et al., 2007). We, therefore, suggest further research in this field in addition to focusing on this scale in counseling services and health promotion campaigns targeting breast cancer survivors in KSA.

Future perspective showed the lowest scores and worse quality of life within the functional scales of the breast module (BR23) (mean=51.41±38.81SD). This score is worse than scores from the UK (mean=54.8±29.4 SD) (Hopwood et al., 2007) and KSA (67.84± 37.07) (Imran et al., 2019). Further research is recommended to compare the breast surgery operations conducted in KSA with those in the UK(Hopwood et al., 2007). It is also recommended that counselors and those in charge of the psychosocial

support programs should focus on this domain. Regarding the symptoms, scales of the QLQBR23 "upset by hair loss" had the worst mean score (mean=54.52±40.96SD), with 36.45% of participants scoring more than 66.7%. These scores are higher than those reported in Bahrain (mean=46.3±42.9 SD) (Jassim and Whitford, 2013), where only 13.4% of participants scored more than 66.7%, KSA (45.83%± 39.66SD) (Imran et al., 2019) and UK (50.6%± 36.2SD) (Hopwood et al., 2007). This is another area that needs more attention during counseling pre and post-treatment.

More interestingly, age of diagnosis, marital status, participation in any psychological program, and HADS depression scores were statistically significant predictors of the global quality of life score; older age group at diagnosis, married female patients, reported depression, and not participating in any psychological program was an important predictor of low quality of life score. The above point indicates that these groups need more attention in psychosocial support programs. Moreover, "Not Participating in Psychological Program" predicted poor quality of life scores, therefore, it is essential for the treating physician to ensure that his/her patients are reference and seen by psychologist and joins available support programs. Similar to a study from Bahrain (Jassim and Whitford, 2013), age was not a statistically significant predictor of the quality of life or psychological wellbeing scores. In our study, the age range was from 26 to 65. Excluding women, older than 65 might justify this result. In KSA, the prevalence of chronic diseases is high amongst women older than 65. This might affect the overall result of this study. This is contrary to a Malaysian study and KSA, in which it was determined that patients age-group were predictors on quality of life (Ganesh et al., 2016; Imran et al., 2019).

Similar to results from Iran, the HADS score had a statistically significant correlation with global health scores (Montazeri et al., 2003). This means that those who were more anxious or depressed showed a lower global quality of life. It is recommended that counselors and psychosocial support programs should also focus on married status as a factor that could have an adverse impact on the quality-of-life scores.

Other predictors of individual scores were similar to those reported in published studies, such as the presence of recurrence since baseline, educational level, current social problems, the extent of the disease, presence of financial difficulties, and employment status (Jassim and Whitford, 2013; Waldmann et al., 2007). Future psychosocial support and counseling services need to consider in their programs

those with low education, low income and those with financial difficulties.

Out of the study participants, 43.5% had moderate to severe anxiety, where 47 participants (19.11%) had severe anxiety. Using the HADS score, 56.51% of participants had moderate to severe depression, and 27,24% had severe depression. Results from Germany showed that at 18 to 24 months after diagnosis, only 19.9% of patients were abnormal on the depression scale and 29.1% were abnormal on the anxiety scale (Dahl et al., 2010), and from China that 21% and 36% had abnormal anxiety and depression, respectively (So et al., 2009). However, there was a difference in the proportion of patients with anxiety or depression between these populations. The worrying result is that many patients were unaware that they might have depression or anxiety. This is presumed to be because no psychological screening had been offered to them previously. The patients' unawareness is certainly the result of a lack of psychological counseling and screening at this hospital.

Our study has found the presence of financial problems affecting life or health as one of the main predictors of the psychological wellbeing scores. Therefore, attention should be given to patients with a low income as they are at a higher risk for psychological impairment and anxiety secondary to breast cancer. Also, place of residence (renting or not owning a house) and previously diagnosed with anxiety had statistically significant predictors of high HADs anxiety scale while the pathological type (invasive ductal carcinoma) had statistically significant predictors of low HADs anxiety scale.

Regarding HADs depression scale, presence of chronic disease, living in rural areas, and being previously diagnosed with anxiety had statistically significant predictors of high HADs depression scale. In contrast, the pathological type (invasive ductal carcinoma) had a statistically significant predictor of low HADs depression scale.

Regarding participation in support programs, this study showed that 57% of the participants had engaged in cancer rehabilitation and 24% in other psychosocial support programs (Mehnert and Koch, 2008). Results from Turkey revealed that the hopelessness of breast cancer patients decreased with the increase in their social support (Öztunç et al., 2013). A pilot study from the same country showed that group therapy significantly reduces depression, anxiety, and distress for patients with breast cancer (Yavuzsen et al., 2012). In contrast, only 14.16% of our study participants received psychological counseling after diagnosis, and only 6.8% participants in the psychosocial support programs. The above figures explore the big gap in cancer rehabilitation and psychosocial support programs between developed and developing countries. This could justify the poor quality of life scores and the high psychological co-morbidities detected in KSA compared with other countries.

The main limitations of this study were that we could not get information from the patients who did not come for follow-up, those receiving treatment in the private sector, and those older than the age of 65 years.

Regarding conclusions and recommendations, our

multicenter study from the KSA shows that breast cancer patients in KSA have a good quality of life scores compared to patients from Western countries. However, their psychological wellbeing is more impaired, with around half of the sample detected with moderate to high scores on the HADS scale. A small proportion of participants joined psychosocial support programs, and further work is needed to improve current rates. Financial constraints and worries also require more attention. We recommend that social services study potential solutions for employment and financial constraints of breast cancer survivors in the KSA.

In conclusion, the results of this study provide valuable data for breast cancer care providers in order to assess the outcomes of their management from patients' perspectives. Detected specific impairments in health-related quality of life or psychological wellbeing could help in the future management of breast cancer patients and hopefully stimulate further research in this field.

Author Contribution Statement

Munir Abu-Helalah: Proposal development, questionnaires and chart review forms development, project management, paper writing. Hani Mustafa: review project proposal, contributes to questionnaires and chart review forms development, data collection, review of the scientific paper and project management. Hussam Alshraideh: statistical analysis of the project. Abdullah Ibrahim Alsuhail: project local site PI, review the project proposal, local site PI. Omar A.Almousily: review project proposal, contributes to questionnaires and chart review forms development, review paper. Ruba Al-Abdallah: review questionnaires and chart review form, project coordinator, writing the first draft of the discussion in the paper. Abdulrahman Al Shehri, project local site PI, review the project proposal, local site PI.

Acknowledgements

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