

# Factors Affecting Health Related Quality of Life among Women with Breast Cancer Receiving Chemotherapy

Salehah Hamid Al Shaikh<sup>1,\*</sup>, Samah Mahmoud Sofar<sup>2</sup>

<sup>1</sup>Master of Nursing Medical Surgical Department, KAAU, JED, SA

<sup>2</sup>Lecturer of Medical Surgical Nursing Department, Faculty of Nursing, Alexandria University, Egypt

\*Corresponding author: umbasil\_2003@yahoo.com

Received October 03, 2018; Revised November 22, 2018; Accepted December 27, 2018

**Abstract Introduction:** Chemotherapy is the most common therapeutic modality used in the treatment of breast cancer. It has different side effects, with associated degrees of disruption in quality of life. Health-related quality of life (HRQOL) is a multidimensional concept, considered as a subjective assessment of physical, social, psychological, and spiritual factors. **The study aim:** To assess factors affecting health related quality of life among women with breast cancer receiving chemotherapy. **Design:** Quantitative, descriptive correlational design was used. **Setting:** Chemotherapy Department, King Abdullah Medical City (KAMC) in Makkah. **Sample:** A convenient sample of 122 women was selected. **Tools:** Three tools were used for data collection. First, demographic and clinical data. Second, 36-Short Form version 1, and third, Factors affecting health related quality of life among women with breast cancer receiving chemotherapy questionnaire. **Results:** More than half 51.6% of the studied women were moderately affected regarding overall factors affecting health related quality of life. There was a significant negative relationship between psychological factors and quality of life ( $P < 0.001$ ). **Conclusion:** The majority of studied women had moderately affected by overall social factors and nearly two third had moderately affected by overall psychological factors. While more than half were moderately affected by overall physical and spiritual factors. Moreover, women had moderate level of overall QOL. **Recommendation:** The study recommended for further research to develop self-care practices educational program for women with breast cancer receiving chemotherapy.

**Keywords:** factors affecting health, health related quality of life, breast cancer, chemotherapy

**Cite This Article:** Salehah Hamid Al Shaikh, and Samah Mahmoud Sofar, "Factors Affecting Health Related Quality of Life among Women with Breast Cancer Receiving Chemotherapy." *American Journal of Nursing Research*, vol. 7, no. 1 (2019): 37-50. doi: 10.12691/ajnr-7-1-6.

## 1. Introduction

Breast cancer is the second most common type of cancer affecting women worldwide [1]. The Saudi Cancer Registry [2] asserted that the estimated incidences of breast cancer are 29.1% and increasing annually. In addition, breast cancer represents the most common cancer affecting Saudi Arabian women, with 1853 new cases reported in 2015. The lifetime risk of breast cancer for Saudi Arabia women is one in every nine women, while the mean age of diagnosis of breast cancer is 50 years old [2]. Despite breast cancer screening services in Saudi Arabia being provided free, there has been an extremely low turn-up for the screening [3]. In Saudi Arabia (2013) according to the Sheikh Mohammed Al-Amoudi Center of Excellence in Breast Cancer, about 70% of cancer cases are detected at advanced stages rather than early detection in comparison to western countries. However, there seems to be an even geographical distribution of women with breast cancer in Saudi Arabia, as majority of women diagnosed from different regions in Saudi Arabia [3].

Breast cancer is a complex and multifactorial disease that results in abnormal cell growth, leading to malignant tumor formation [4]. Breast cancer has many types of treatment modalities, such as surgical, chemotherapy, radiation, hormonal and biotherapy [5]. Chemotherapy is the most common therapeutic modality used in the treatment of breast cancer [6,7]. Chemotherapy is cytotoxic agents designed to stop cancer cells by either destroying them or inhibit their growth to prevent cancer cells from metastases. Treatment with chemotherapy depends on woman's age, menopausal status, cancer stage, tumor size, location and molecular subtype [8]. Chemotherapy can be used as a single agent or in-combination with other modality therapy [9]. On the other hand, chemotherapy is associated with numerous side effects such as fatigue, pain, stomatitis, loss of appetite nausea, vomiting, dyspnea, diarrhea, constipation, and lymphedema [10,11]. Women with breast cancer will be affected physically, socially, psychologically, and spiritually by chemotherapy side effects which in turn affect women health-related quality of life.

Health-related quality of life (HRQOL) is a multidimensional concept, considered as a subjective

assessment of physical, social, psychological, and spiritual factors [12,13]. The main focus of health-related quality of life is the effects of illnesses on women and their treatment [13]. Measuring HRQOL is a challenge due to the experiences of women with breast cancer are different and may vary over time. Furthermore, women with breast cancer have fears and worries about their health and need support when receiving chemotherapy in order to empower women to cope the chemotherapy side effects [14].

The World Health Organization [15] reported that breast cancer is the predominant type of cancer in women. Actually, it is a considerable factor affecting women in Saudi Arabia as it contributes to the highest number of deaths around the world [16]. In this light, chemotherapy is the treatment procedure undertaken to curb the re-occurrence of breast [17]. This treatment approach is facing dynamic changes that aim at bettering its treatment efficiency. Among the notable changes is the ability to interfere with the rapidly dividing cells and molecules that accelerate tumor growth and eventually the spread of cancer [18]. The squeals of breast cancer and its treatment have considerable impact on Health-related quality of life, which in turn affects the ability of these women with breast cancer to perform many of usual roles in their lives [19,20]. Some study have noted declines in health-related quality of life during chemotherapy followed by returns to baseline after treatment is completed [21]. For these reasons, sustaining and improving the quality of life after undergoing chemotherapy has become one of the most significant areas of interest in clinical research and practice [22].

There is a growing body of nursing literature on the physical, social, psychological, and spiritual domains of health-related quality of life. Although Cheng et al. [23] addressed that the majority of studies regarding quality of life among women with breast cancer aimed to examining the women's QOL after completing aggressive treatment. Essentially, limited studies have explored factors related to QOL during the acute chemotherapy treatment phase. Therefore, nurses should emphasized on the assessment of chemotherapy side effects during the acute phase to improve the patient's quality of care.

## 2. Research Aim

To assess factors affecting health related quality of life among women with breast cancer receiving chemotherapy.

## 3. Research Question

1. What are the factors affecting health related quality of life among women with breast cancer receiving chemotherapy?
2. What are the levels of quality of life in women with breast cancer receiving chemotherapy?
3. What is the relationship between the factors affecting health and women' quality of life?
4. What is the relationship between sociodemographic and clinical data with factors affecting health related quality of life?

## 4. Materials and Method

### 4.1. Materials

#### 4.1.1. Design

Quantitative, descriptive correlational design was used in carrying out this study.

#### 4.1.2. Setting

This study was conducted at King Abdullah Medical City (KAMC) in the Holy Capital Oncology Center, in Chemotherapy Unit. The oncology inpatient services consist of: Medical Oncology Ward with beds capacity 40 beds and current active beds 35 beds, Hematology Oncology Ward with beds capacity 50 beds and current active beds 15 beds, Chemotherapy Unit with capacity 17 beds, and Palliative Care Unit with bed capacity 10 beds (KAMC annual report, 1434 H).

#### 4.1.3. Sample

The total number of women diagnosed with breast cancer at King Abdullah Medical City in 2015 was 178. A convenience sample of 122 women was selected by using Robert Mason equation with 95% confidence interval, 5% margins of error and 50% prevalence of women with breast cancer.

$$n = \frac{M}{\left[ \left( S^2 \times (M - 1) \right) \div pq \right] + 1}$$

M: Population size = 178.

S = z/E, z: coefficient level at 95% (standard value of 1.96), E: error proportion = 0.05.

P: the probability (30%-60%) or = 50% the best.

q: 1-p = 0.25.

n: sample size = 122 women.

#### Inclusion Criteria

Women with breast cancer receiving chemotherapy under surgical protocol or not; stage I, II, and III breast cancer; aged from 20 years to 60 years; after received third cycle; able to speak Arabic or English Language; willingly agree to participate in the study.

#### Exclusion Criteria

Women with history of mental illness; metastasis and cognitive impairment.

#### 4.1.4. Tool of the Study

Three tools were used in the study to collect the necessary data.

##### Tool 1: Socio-Demographic and Clinical data sheet:

It was developed by the researcher according to review of relevant literatures, it aimed to collect patient's personal and clinical data. It divided into two parts:

##### Part 1: Sosio-Demographic data:

It was included: age; nationality; marital status; level of education; occupation; income; financial support from government; area of residence; living with family members and data of being involved in the study.

##### Part II: Clinical data:

It was included: weight; height; body mass index; family history of breast cancer; co-morbidity; hemoglobin

level; red blood cells level; white blood cells level; have any benign tumors before; kind of breast cancer; treatment methods; type of surgery; diameter of the tumor; stages of breast cancer; recent chemotherapy cycle; chemotherapy delayed or discontinued for any reason; and chemotherapeutic protocol.

#### **Tool II: 36-Item Short form survey, version 1 (SF-36).**

This tool was developed by research and development Corporation (RAND), which is a nonprofit institution [24]. It aimed to assess health related quality of life (HRQOL). The SF-36 multiple-choice questions consisted of eight scales as the following: physical functioning 10 items, role limitations caused by physical health role 4 items, role limitations caused by emotional role 3 items, body pain 2 items, vitality energy/fatigue 4 items, social functioning 2 items, mental health 5 items and general health perceptions 5 items.

Items are measured using binary responses (yes/no); categorical responses (not at all, somewhat, a lot); and 5-point Likert scales, ranging from 1 all of the time to 5 none of the time. Higher scores defines a more favorable Quality of life. The score was calculated according the scoring rules of the RAND Health Survey version I [25].

#### **Tool III: Factors affecting quality of life among women with breast cancer receiving chemotherapy questionnaire:**

This tool was developed by the researcher based on review of relevant literatures to assess factors affecting health related quality of life among women with breast cancer receiving chemotherapy [26,27,28,29,30]. The questionnaire is composed of 83 items describing the four factors as following:

- **Physical factors** was included 49 items about: General manifestations (5 items), CNS manifestations (3 items), cardiopulmonary manifestations (2 items), GIT manifestations (6 items), Skin & hair (3 items), activities of daily living (7 items), Indoor activities (10 items), outdoor activities (3 items), sexuality (3 items), arm edema (2 items), extravasations (4 items).
- **Social factors** was included 10 items about: feel safe in family; feel independent; have enough time to do the things want to do; able to get an appointment when need referral to clinic/physician; meet friends; need to have strong connections with people; maintaining relationships is important to you; get support from family; physical condition or medical treatment caused financial difficulties; participate in social groups work.
- **Psychological factors** was included 13 items about: Ability to enjoy life; sit at ease and feel relaxed; fear; sad; anxious; losing interest in thing; accepting illness; less physically attractive as a result of disease or treatment; worry that condition will get worse; worry about die; bother by hair loss; dissatisfaction with appearance; avoid being with people.
- **Spiritual factors** was included 15 items about: Self-awareness 5 items, spiritual practices 6 items, spiritual needs 4 items.

#### **4.1.5. Scoring System**

Each item was weighted on a scale of 3 points 1= rarely affected, 2= moderately affected, 3= highly affected. Total score classified as the following:

1. Mean from 2.34 to less than 3.00 of the total health related quality of life scores were considered highly affected.
2. Mean from 1.67 to less than 2.34 of total health related quality of life scores were considered moderate affected.
3. Mean from one to less than 1.67 of total health related quality of life scores were considered rarely affected.

## **4.2. Method**

### **4.2.1. Ethical Consideration**

Written approval was obtained from the faculty of nursing, King Abdul Aziz University and King Abdullah Medical City in the Holy capital, Institutional Review Board. Written consent was obtained from participants after explained the purpose of the study. Confidentiality and privacy were assured.

### **4.2.2. Validity**

The content of the tools were revised by 7 experts in the field of Medical Surgical Department Faculty of Nursing at King Abdul Aziz University to test content validity, completeness, and clarity of items, comments and suggestion of experts was considered and the tool was modified accordingly.

### **4.2.3. Reliability**

The reliability of tool II: 36-Item Short form survey, version 1 has good reliability, Cronbach's alpha ranged from 0.68 to 0.94 [31,32]. In the current study, Cronbach's alpha reliability ranged from 0.71 to 0.85. The reliability of tool III has good reliability, Cronbach's alpha ranged from 0.77 to 0.82.

### **4.2.4. Pilot Study**

A pilot study was conducted on 10% of sample size equivalent to 12 women to test clarity, feasibility, and applicability of the study and tools, modifications were done based on the results. Participants excluded from the main study sample.

### **4.2.5. Data Collection Process**

After ethical approval was obtained, the data collection was started and continued for a period from March to November 2016.

- The researcher reviewed the women' medical file for compliance with study clinical data.
- The women who agree to participate were interviewed individually once by the researcher, each interview was about 30-40 minutes.
- The researcher was filled the socio-demographic questionnaire using tool I parts I from the women and clinical data questionnaire using tool I parts II from the patients' medical file.
- Then, the researcher assess women quality of life by using tool II 36-Item short form survey, version 1 (SF-36).
- After that, the researcher assess the factors affecting quality of life among women with breast cancer receiving chemotherapy using tool III factors affecting

quality of life among women with breast cancer receiving chemotherapy questionnaire.

- Finally, the collected data was analysed.

#### 4.2.6. Statistical Analysis

Data were coded, organized, fed to the computer and analyzed using IBM Statistical Package for Social Sciences analysis (SPSS) software version 24.0. Quantitative data were described using frequency and percentages, means and standard deviations. Relationship between variables were tested using T-test or ANOVA. Moreover, Pearson correlation coefficient was used.

## 5. Results

Table 1 shows frequency distribution of the studied women with breast cancer in relation to sociodemographic characteristics.

**Table 1. Frequency distribution of the studied women with breast cancer in relation to socio-demographic characteristics**

Personal characteristics	Studied women (n=122)	
	Frequency	%
Age (in years)		
20 < 30	5	4.1
30 < 40	19	15.6
40 < 50	55	45.0
50 < 60	34	27.9
≥ 60	9	7.4
Nationality		
Saudi	99	81.1
Non Saudi	23	18.9
Marital status		
Single	2	1.6
Married	71	58.2
Divorced	28	23.0
Widow	21	17.2
Level of education		
Illiterate	12	9.8
Read and write	13	10.7
Basic education completed	43	35.2
Secondary education	39	32.0
University	15	12.3
Occupation		
Housewives	108	88.5
Cleric work	8	6.6
Manual	1	0.8
Professionals	1	0.8
Retired	3	2.5
Other	1	0.8
Monthly income		
Enough	102	83.6
Not enough	20	16.4
financial support from government		
yes	37	30.3
No	85	69.7

Nearly half of the sample (45.0%) were in the age group of (40 < 50) years, while only (4.1%) were in the age group of (20 < 30) years. The majority (81.1%) were Saudi. More than half (58.2) were married. About (35.2%) had basic education, while only (12.3%) had university education. The majority (88.5%) were housewife. About (16.4%) had insufficient monthly income to fulfill the daily requirements.

Table 2 Shows frequency distribution of the studied women with breast cancer in relation to the clinical characteristics.

The majority (79%) of the studied women had no family history, while (20.5%) had close family member with breast cancer. More than half (59.8%) had no chronic diseases, while only (8.2%) and (18%) had diabetes mellitus and hypertension. The majority (80.3%) had amenorrhea. The majority (92.6%) had no previous history, while (7.4%) of had suffered from past history of benign tumors.

Table 3 Shows frequency distribution of the studied women in relation to their breast cancer types and chemotherapy.

The highest majority (94.3%) had invasive ductal carcinoma, while only (3.3%) had ductal carcinoma in situ, and (2.5%) had invasive lobular carcinoma. About (32.79%) were treated by chemotherapy, and (22.13%) treated surgically, while only (1.64%) by chemotherapy and biotherapy. Nearly two third (70.5%) had T3 (> 5 cm), while only (1.6%) had T1 (<2 cm). The majority (86.9%) had stage III, while the minority (1.6%) had stage I. About (26.2%) had 3th cycle of chemotherapy, while (6.6%) had 7th cycle of chemotherapy. Nearly three quarters (74.6%) had no delayed or discontinued chemotherapy cycle. About (21.3 %) had neutropenia. About (38.5%) of the were received docetaxel, while only (9.8%) were received FEC.

**Table 2. Frequency distribution of the studied women with breast cancer in relation to the clinical characteristics**

Clinical characteristics	Studied women (n=122)	
	Frequency	%
<b>Having family history of breast cancer</b>		
Yes	25	20.5
No	97	79.5
<b>Co-morbidity</b>		
No chronic disease	73	59.8
Gastrointestinal disorders	4	3.3
Hypertension	22	18.0
Diabetes mellitus	10	8.2
Cardiac disease	5	4.1
Hypertension & Diabetes mellitus	8	6.6
<b>Menopausal status after chemotherapy</b>		
Amenorrhea	98	80.3
Menopausal	24	19.7
<b>Having any benign tumors before</b>		
Yes	9	7.4
No	113	92.6

**Table 3. Frequency distribution of the studied women in relation to their breast cancer types and chemotherapy**

cancer types and chemotherapy	(n=122)	
	F	%
Types of breast cancer		
Ductal carcinoma in situ	4	3.3
Invasive ductal carcinoma	115	94.3
Invasive lobular carcinoma	3	2.5
Treatment methods		
Chemotherapy	40	32.79
Chemotherapy and Surgery	27	22.13
Chemotherapy and hormonal	4	3.28
Chemotherapy and biotherapy	2	1.64
Chemotherapy, Surgery and hormonal	27	22.13
Chemot, surgery, radio, hormonal, and biotherapy	22	18.03
Type of Surgery		
Mastectomy	71	58.2
Breast conserving surgery	4	3.3
Mastectomy and breast reconstruction	3	2.5
No Surgery	44	36.0
Stages of breast cancer		
I	2	1.6
II	14	11.5
III	106	86.9
Chemotherapy cycle		
3 <sup>th</sup>	32	26.2
4 <sup>th</sup>	19	15.6
5 <sup>th</sup>	17	13.9
6 <sup>th</sup>	24	19.7
7 <sup>th</sup>	8	6.6
8 <sup>th</sup>	22	18.0
Chemotherapy cycle delayed or discontinued		
Yes	31	25.4
No	91	74.6
Reason for chemotherapy cycle delayed or discontinued		
Immune (Neutropenia)	26	83.9
Extravasations	1	3.2
Influenza	2	6.5
Delivery	1	3.2
Refuse and immune	1	3.2
Chemotherapeutic protocol		
Docetaxel	47	38.5
FEC-Epirubicin, cyclophosphamide and fluorouracil	12	9.8
AC-Aoxorubicin (Adriamycin) and cyclophosphamide	32	26.2
Paclitaxel	14	11.5
Two protocol	17	14

Table 4 shows the frequency distribution of the studied women with breast cancer receiving chemotherapy in relation to physical factors.

The majority (87.7%) of the studied women were highly affected by fatigue and more than half (60.7%) of the studied women were highly affected by general pain. Moreover, nearly half (42.6%) of studied women were moderately affected by insomnia. Regarding central nervous system, nearly two third (67.2%) of studied women were moderately affected by numbness of the extremities. Regarding gastrointestinal tract, around half (50.8%), (57.4%) of studied women were highly affected by dry mouth and anorexia. In addition more than two third of studied women (76.2%) were rarely affected by vomiting. Moreover more than half (59%) of studied women were moderately affected by nausea. Regarding

skin and hair, almost all studied women (95.9%) were highly affected by alopecia.

Considering activities of daily living, more than half (59%) of studied women were highly affected by taking frequent bed rest. Moreover, more than half (55.7%) of studied women were moderately affected by division of each task done. Regarding assessing indoor activities for women undergoing surgery about third of studied women (35.52%) were highly affected by closure blouse from the back, while near half (47.37%) of studied women were highly affected by sleeping on the affected side. Concerning assessing outdoor activities, nearly half (43.4%), (45.9%), (49.2%) of studied women were highly affected by carrying a shopping bag, pushing a heavy door, and lifting heavy objects respectively.

Table 5 shows the frequency distribution of the studied women with breast cancer in relation to social factors.

The majority (90.2%) of the studied women were rarely affected by feeling safe in family. Moreover nearly half (45.9%) of the studied women were highly affected by inability to meeting friends. In addition, the majority (87.7%) of the studied women were highly affected by maintaining relationships with others. Furthermore, near one-third (32%) of the studied women were moderately affected by get support from family, while (13.9%) of the studied women were highly affected by financial difficulties due to treatment cost treatment. Moreover, more than two-third (76.2%) and (74.6%) of the studied women were highly affected by participation in social work group and need to have strong connections with people respectively.

Table 6 shows the frequency distribution of the studied women with breast cancer receiving chemotherapy in relation to psychological factors.

Regarding psychological factors, Regarding psychological factors, it was found that about two-third (71.3%) and (79.5%) of the studied women were moderately affected by ability to enjoy their life and feeling relaxed, while only (37.7%) of the studied women were highly affected by feeling sad. On the other hand, more than half (50.8%), (58.2%) of the studied women were moderately affected by fear and worry about her condition. In addition, it was found that more than half of studied women (69.7%) were highly affected by feel less physically attractive and (43.4%) of studied women were highly affected by hair loss. Moreover, it was found that near two third (70.5%) of the studied women were rarely affected by avoid being with people because their appearance.

Table 7 shows the frequency distribution of the studied women with breast cancer receiving chemotherapy in relation to spiritual factors.

Regarding self-awareness, the majority (94.3%), (85.2%) of the studied women were highly affected by feeling trust in God and empathy with others, as well as near two-third (66.4%) of the studied women were highly affected by found meaning in difficult situation. In addition, near two-third (62.3%) of the studied women were rarely affected by loneliness. Considering spiritual practices, the majority (85.2%), (82.8%) of the studied women were moderately affected by thinking to achieve inner peace and finding any opportunity to enhance spirituality condition. Regarding spiritual needs, the majority (83.6%) of studied women were highly affected by listening to holy Qur'an, while only (5.7%) were rarely affected by seek beauty.

Table 8 the level of the eight health concepts for QOL of the studied women with breast cancer receiving chemotherapy.

Regarding all eight concepts for QOL level, the majority (81.4%) of the studied women had moderate level of QOL. In addition, the majority (94.3%), (89.4%), and (77.9%) of the studied women were had poor level in role limitations

due to physical health and emotional problems, as well as vitality (energy/fatigue) respectively. Furthermore, (75.4%) (56.6%) (33.6%) (53.3%) of the studied women had moderate level in physical functioning, emotional well-being, social functioning, and pain, while near two-third (73 %) of the studied women had good level regarding general health.

**Table 4. Frequency distribution of the studied women with breast cancer receiving chemotherapy in relation to physical factors**

Physical Factors	Rarely affected		Moderately		Highly affected		Mean	Std. Deviation	T test	P value
	F	%	F	%	F	%				
<b>General Manifestations</b>										
Feeling fatigue.	1	0.8%	14	11.5%	107	87.7%	2.87	0.363	36.832	0.000*
General pain.	8	6.6%	40	32.8%	74	60.7%	2.54	0.619	15.732	0.000*
Insomnia.	40	32.8%	52	42.6%	30	24.6%	1.92	0.756	3.769	0.000*
Itching.	58	47.5%	54	44.3%	10	8.2%	1.61	0.637	-0.927	0.356
Flushing.	92	75.4%	16	13.1%	14	11.5%	1.36	0.681	-4.854	0.000*
<b>CNS Manifestations</b>										
Loss of balance.	78	63.9%	36	29.5%	8	6.6%	78	0.615	-4.195	0.000*
Tingling of the extremities.	68	55.7%	42	34.4%	12	9.8%	68	0.670	-1.962	.052**
Numbness of the extremities.	20	16.4%	82	67.2%	20	16.4%	20	0.575	6.532	0.000*
<b>Cardiopulmonary Manifestations</b>										
Palpitation	60	49.2%	59	48.4%	3	2.5%	1.53	0.548	-2.563	.012**
Dyspnea	69	56.6%	47	38.5%	6	4.9%	1.48	0.592	-3.289	0.001*
<b>GIT Manifestations</b>										
Stomatitis	43	35.2%	48	39.3%	31	25.4%	1.90	0.776	3.440	0.001*
Dry mouth	14	11.5%	46	37.7%	62	50.8%	2.39	0.687	11.791	0.000*
Anorexia	16	13.1%	36	29.5%	70	57.4%	2.44	0.716	12.067	0.000*
Nausea	11	9.0%	72	59.0%	39	32.0%	2.23	0.600	10.482	0.000*
Vomiting	93	76.2%	24	19.7%	5	4.1%	1.28	0.534	-7.885	0.000*
Diarrhea	72	59.0%	44	36.1%	6	4.9%	1.46	0.591	-3.755	0.000*
Constipation	46	37.7%	68	55.7%	8	6.6%	1.69	0.590	0.534	0.595
<b>Skin &amp; hair</b>										
Dry skin	26	21.3%	49	40.2%	47	38.5%	2.17	0.757	7.470	0.000*
Sore on hands or feet	107	87.7%	10	8.2%	5	4.1%	1.16	0.470	-11.66	0.000*
Alopecia	1	0.8%	4	3.3%	117	95.9%	2.95	0.252	56.501	0.000*
<b>Activities of daily living</b>										
Task not complete.	5	4.1%	59	48.4%	58	47.5%	2.43	0.575	14.882	0.000*
Divide each task done.	9	7.4%	68	55.7%	45	36.9%	2.30	0.599	11.716	0.000*
Prepare equipment before task.	10	8.2%	62	50.8%	50	41.0%	2.33	0.622	11.851	0.000*
Frequent bed rest.	16	13.1%	34	27.9%	72	59.0%	2.46	0.718	12.300	0.000*
Ascent / descent stair.	83	68.0%	33	27.0%	6	4.9%	1.37	0.578	-5.565	0.000*
Able get in and out of a car.	109	89.3%	10	8.2%	3	2.5%	1.13	0.406	-14.40	0.000*
Able to prayer.	91	74.6%	29	23.8%	2	1.6%	1.27	0.482	-8.932	0.000*
<b>Assessing activities regarding range of motion in arm on surgery side ( n=76) Indoor activities</b>										
Decreased range of motion	52	68.4%	16	21.1%	8	10.5%	1.42	0.678	-3.070	0.003*
Washing hair.	72	94.7%	4	5.3%	0	0.0%	0.69	0.604	-20.47	0.000*
Combing hair.	69	90.8%	6	7.9%	1	1.3%	1.01	0.966	-17.76	0.000*
Washing back.	39	51.3%	27	35.5%	10	13.2%	1.30	1.190	-7.45	0.000*
Closed blouse from the back.	21	27.6%	28	36.8%	27	35.5%	0.90	0.876	-3.387	0.001*
Washing utensils.	49	64.5%	20	26.3%	7	9.2%	0.82	0.803	-9.564	0.000*
Putting laundry on the rope.	58	76.3%	12	15.8%	6	7.9%	0.77	0.747	-11.56	0.000*
Cutting with a knife.	63	82.9%	8	10.5%	5	6.6%	0.93	0.916	-13.15	0.000*
Putting objects on a high shelf.	47	61.8%	20	26.3%	9	11.8%	1.48	1.274	-8.751	0.000*
Sleeping on the affected side.	8	10.5%	31	40.8%	37	48.7%	0.9508	0.798	-1.529	0.129
<b>Outdoor activities</b>										
Carrying a shopping bag.	11	14.5%	13	17.1%	52	68.4%	1.58	1.366	-0.631	0.000*
Pushing a heavy door.	10	13.2%	12	15.8%	54	71.1%	1.61	1.376	-0.429	0.000*
Lifting heavy objects.	6	7.9%	12	15.8%	58	76.3%	1.67	1.393	0.096	0.000*
<b>Sexuality (n= 71). No. of married women = 71(58.2%)</b>										
Lack of sexual desire.	8	11.4%	23	32.9%	39	55.7%	1.40	1.322	-2.159	.033**
Sexual pain (dyspareunia).	27	38.6%	16	22.9%	27	38.6%	1.15	1.197	-4.729	0.000*
Vaginal dryness.	29	41.4%	26	37.1%	15	21.4%	1.03	1.067	-6.490	0.000*
Lymphedema Sign	94	77.0%	15	12.3%	13	10.7%	1.3975	0.571	-5.076	0.000*
Extravasations Sign	88	72.1%	25	20.5%	9	7.4%	1.4693	0.4597	-4.583	0.000*
Overall Physical Factors	56	45.9%	63	51.6%	3	2.5%	1.7496	0.2334	6.668	0.000*

**Table 5. Frequency distribution of the studied women with breast cancer in relation to social factors**

Social Factors	Rarely affected		Moderately affected		Highly affected		Mean	Std. Deviation	T test	P value
	F	%	F	%	f	%				
Feeling safe in family.	110	90.2%	11	9.0%	1	0.8%	1.11	0.335	-18.224	0.000*
Independent.	107	87.7%	14	11.5%	1	0.8%	1.13	0.363	-16.113	0.000*
Having enough time to do the things.	100	82.0%	18	14.8%	4	3.3%	1.21	0.485	-10.178	0.000*
Get an appointment when need referral to clinic/ physician.	102	83.6%	17	13.9%	3	2.5%	1.19	0.451	-11.535	0.000*
Meeting friends' inability.	12	9.8%	54	44.3%	56	45.9%	2.36	0.656	11.790	0.000*
Need to have strong connections with people.	4	3.3%	27	22.1%	91	74.6%	2.71	0.522	22.287	0.000*
Maintaining relationships important to you.	1	0.8%	14	11.5%	107	87.7%	2.87	0.363	36.832	0.000*
Get support from family.	60	49.2%	39	32.0%	23	18.9%	1.70	0.770	0.527	0.599
Financial difficulties due to treatment cost	65	53.3%	40	32.8%	17	13.9%	1.61	0.722	-0.817	.415**
Participate in social groups work.	8	6.6%	21	17.2%	93	76.2%	2.70	0.588	19.488	0.000*
Overall Social factors	19	15.6%	103	84.4%	0	0.0%	1.86	0.22038	9.933	0.000*

\* One sample statistics test is significant at  $\leq 0.01$  level (2-tailed).  
 \*\* One sample statistics test is significant at  $\leq 0.05$  level (2-tailed).

**Table 6. Frequency distribution of the studied women with breast cancer receiving chemotherapy in relation to psychological factors**

Psychological Factors	Rarely affected		Moderately affected		Highly affected		Mean	Std. Deviation	T test	P value
	F	%	F	%	F	%				
Able to enjoy life.	27	22.1%	87	71.3%	8	6.6%	1.84	0.515	3.955	0.000*
Able sit at ease and feel relaxed.	16	13.1%	97	79.5%	9	7.4%	1.94	0.451	6.924	0.000*
Fear.	21	17.2%	62	50.8%	39	32.0%	2.15	0.688	7.822	0.000*
Sad.	16	13.1%	60	49.2%	46	37.7%	2.25	0.672	9.632	0.000*
Anxious.	14	11.5%	70	57.4%	38	31.1%	2.20	0.625	9.484	0.000*
Lost interest in thing.	12	9.8%	64	52.5%	46	37.7%	2.28	0.633	10.791	0.000*
Accept illness.	76	62.3%	45	36.9%	1	0.8%	1.39	0.505	-6.006	0.000*
Feel less physically attractive.	9	7.4%	28	23.0%	85	69.7%	2.62	0.621	17.129	0.000*
Worry that condition will get worse.	32	26.2%	71	58.2%	19	15.6%	1.89	0.640	4.027	0.000*
Worry about die.	40	32.8%	69	56.6%	13	10.7%	1.78	0.623	2.103	0.038**
Bother by hair loss.	19	15.6%	50	41.0%	53	43.4%	2.28	0.719	9.506	0.000*
Satisfy with appearance.	46	37.7%	66	54.1%	10	8.2%	1.70	0.612	0.810	0.419**
Avoid being with people because appearance.	86	70.5%	30	24.6%	6	4.9%	1.34	0.572	-6.101	0.000*
Overall psychological factors	20	16.4%	88	72.1%	14	11.5%	1.84	0.515	10.476	0.000*

\* One sample statistics test is significant at  $\leq 0.01$  level (2-tailed).  
 \*\* One sample statistics test is significant at  $\leq 0.05$  level (2-tailed).

**Table 7. Frequency distribution of the studied women with breast cancer receiving chemotherapy in relation to spiritual factors**

Spiritual Factors	Rarely affected		Moderately affected		Highly affected		Mean	Std. Deviation	T test	P value
	F	%	F	%	F	%				
<b>Self-Awareness</b>										
Trust in God.	3	2.5%	4	3.3%	115	94.3%	2.92	0.354	39.231	0.000*
Find meaning in difficult situations.	6	4.9%	35	28.7%	81	66.4%	2.61	0.581	18.140	0.000*
Try to be patient and tolerant.	4	3.3%	50	41.0%	68	55.7%	2.52	0.564	16.946	0.000*
Feel alone.	76	62.3%	35	28.7%	11	9.0%	1.47	0.658	-3.237	0.002**
Try to be empathetic with others.	6	4.9%	12	9.8%	104	85.2%	2.80	0.508	24.837	0.000*
<b>Spiritual practices</b>										
Become involved in spiritual programs.	8	6.6%	31	25.4%	83	68.0%	2.61	0.609	17.313	0.000*
Read books about spirituality.	51	41.8%	43	35.2%	28	23.0%	1.81	0.786	2.130	0.035**
Read holy Qur'an.	16	13.1%	41	33.6%	65	53.3%	2.40	0.712	11.507	0.000*
Think to achieve inner peace.	6	4.9%	104	85.2%	12	9.8%	2.05	0.383	11.238	0.000*
Find any opportunity to enhance spirituality.	3	2.5%	101	82.8%	18	14.8%	2.12	0.398	12.852	0.000*
Use silence to get in touch with yourself.	19	15.6%	89	73.0%	14	11.5%	1.96	0.521	6.344	0.000*
<b>Spiritual needs</b>										
Search for a purpose in life.	16	13.1%	78	63.9%	28	23.0%	2.10	0.595	8.139	0.000*
Listening to holy Qur'an.	0	0.0%	20	16.4%	102	83.6%	2.84	0.372	34.944	0.000*
Seek beauty.	7	5.7%	86	70.5%	29	23.8%	2.18	0.515	11.170	0.000*
Need to achieve inner peace.	10	8.2%	93	76.2%	19	15.6%	2.07	0.484	9.444	0.000*
Overall Spiritual factors	1	0.9%	65	56.0%	50	43.1%	2.308	0.18854	24.279	0.000*

\* One sample statistics test is significant at  $\leq 0.01$  level (2-tailed).  
 \*\* One sample statistics test is significant at  $\leq 0.05$  level (2-tailed).

**Table 8. The level of the eight health concepts for QOL of the studied women with breast cancer receiving chemotherapy**

QOL Level	Poor		Good		Moderate		Mean	Std. Deviation	T test	p-value	The level
	F	%	F	%	F	%					
Physical functioning	15	12.3%	92	75.4%	15	12.3%	2.005	0.29482	12.922	0.000*	Moderate
Role limitations physical health	115	94.3%	4	3.3%	3	2.5%	1.098	0.34401	18.033	0.000*	Poor
Emotional problems	93	89.4%	0	0.0%	11	10.6%	1.333	0.65415	-5.516	0.000*	Poor
Vitality (Energy/fatigue)	95	77.9%	24	19.7%	3	2.5%	1.295	0.42032	-9.589	0.000*	Poor
Emotional well-being	22	18.0%	69	56.6%	31	25.4%	2.053	0.40802	10.624	0.000*	Moderate
Social functioning	48	39.3%	41	33.6%	33	27.0%	1.951	0.62790	5.116	0.000*	Moderate
Pain	32	26.2%	65	53.3%	25	20.5%	1.971	0.55035	6.248	0.000*	Moderate
General health	6	4.9%	27	22.1%	89	73.0%	2.554	0.49177	20.082	0.000*	Good
Overall Quality of life	22	18.6%	96	81.4%	0	0.0%	1.783	0.16884	8.017	0.000*	Moderate

\* One sample statistics test is significant at  $\leq 0.01$  level (2-tailed).

Table 9 reveals Pearson Correlation between the mean of the total level of QOL and the overall factor affecting health of the studied women.

There was a negative significant correlation between overall psychological factors with overall level QOL ( $r=-.465^{**}$ , P-value < 0.000). There was a negative significant correlation between overall factors affecting health with overall level QOL ( $r=-.289^{**}$ , P-value < 0.001).

Table 10 illustrates the relationship of socio-demographic and clinical characteristics on factors affecting HRQOL of the studied women.

There was statistically significance difference between age group and physical factors  $P \leq 0.024^*$ . There was no statistically significance difference of marital status on factors affecting HRQOL of the studied women with breast cancer receiving chemotherapy.

Regarding clinical characteristics, there was statistically

significance difference between stages of breast cancer and psychological factors  $P \leq 0.039^*$ . Finally, there was statistically significance difference between body mass index and spiritual factors  $P \leq 0.006^{**}$ .

**Table 9. Pearson Correlation between the mean of the total level of QOL and the overall factor affecting health of the studied women**

Factors (N=122)	Overall Quality of Life	
1-Physical Factors	Correlation Coefficient	0.117
	Sig. (p-value)	0.199
2-Social Factor	Correlation Coefficient	-0.068
	Sig. (p-value)	0.457
3-Psychological Factors	Correlation Coefficient	-.465- <sup>**</sup>
	Sig. (p-value)	0.000
4-Spiritual factors	Correlation Coefficient	0.002
	Sig. (p-value)	0.982
5-Overall factors affecting health	Correlation Coefficient	-.289- <sup>**</sup>
	Sig. (p-value)	0.001

**Table 10. The relationship of socio-demographic and clinical characteristics on factors affecting HRQOL of the studied women**

Demographic and clinical data		N	Physical Factors			Social Factors			Psychological Factors			Spiritual factors			
			Mean	F	P. value	Mean	F	P. value	Mean	F	P. value	Mean	F	P. value	
Age in years	20 < 30	5	1.65	2.93	0.024*	0.07	0.990	1.65	2.16	0.078	2.35	0.67	0.613		
	30 < 40	19	1.73											1.84	2.01
	40 < 50	55	1.70											1.86	2.03
	50 < 60	34	1.83											1.85	1.95
	> 60	9	1.88											1.87	1.84
Marital status	Single	3	1.69	0.65	0.587	0.59	0.626	1.80	0.62	0.606	2.42	0.56	0.644		
	Married	69	1.76											1.84	1.95
	Divorced	28	1.71											1.86	2.00
	Widow	22	1.79											1.90	1.99
Kind of breast cancer	Ductal carcinoma in situ	4	1.88	0.68	0.507	0.753	0.473	1.73	0.743	0.478	2.33	1.086	0.341		
	Invasive ductal carcinoma	115	1.74											1.86	1.98
	Invasive lobular carcinoma	3	1.79											1.87	1.90
Type of surgery	Mastectomy	71	1.82	1.963	0.148	0.951	0.391	1.84	2.674	0.076	2.31	0.689	0.505		
	Breast conserving surgery	4	1.85											1.95	1.98
	Mastectomy and breast reconstruction	3	1.53											1.70	1.49
Stages of breast cancer	I	2	1.76	0.186	0.830	1.526	0.222	1.60	3.334	0.039*	2.25	0.196	0.823		
	II	14	1.79											1.84	1.88
	III	106	1.74											1.87	2.00
Chemo therapy cycle	1 <sup>ST</sup>	32	1.72	2.143	0.065	0.698	0.626	1.87	0.753	0.585	2.33	0.680	0.639		
	2 <sup>ND</sup>	19	1.65											1.89	1.99
	3th	17	1.71											1.81	2.00
	4 th	24	1.83											1.88	1.89
	5 th	8	1.72											1.90	1.88
	6 th	22	1.83											1.80	1.97
Body mass index	below normal	9	1.81	0.569	0.637	2.179	0.094	1.99	2.293	0.082	2.14	4.323	0.006 <sup>**</sup>		
	Normal	29	1.78											1.83	2.03
	over weight	51	1.73											1.82	1.92
	Obese	33	1.73											1.90	1.95

\*  $P \leq 0.05$  level, \*\*  $P \leq 0.01$  level, F-Test one-way ANOVA.



## 6. Discussion

Breast cancer is an important health issues influencing women quality of life. Assessment Quality of life (QOL) among women with breast cancer has been shown contribution to improve treatment and it an important prognostic factor [33]. Women diagnosed with breast cancer in Saudi Arabia often face many challenges associated with cancer itself and its treatment. Breast cancer and chemotherapy side effects are destructive to the physical, social, psychological, and spiritual factors which affecting health-related quality of life (HRQOL).

The present study was carried out in order to assess the factors that can affecting health related quality of life among women with breast cancer receiving chemotherapy.

**Regarding demographic characteristics**, the results of present study revealed that nearly half the sample of studied women were in the age group of (40 < 50) years. This finding matched with Saudi Cancer Registry (2013) which reported that the mean age of breast cancer cases in Saudi Arabia was 50 years and it occurs at an earlier age.

**Concerning clinical data**, the current study found that more than two third of studied women had no family history with breast cancer. This result is in line with Howlader et al. [8] and Pecorino [34] who emphasized that only 15% of all the breast cancers women are inherited. In addition, the present study revealed that more than half of the studied women had no chronic diseases and only nearly quarter (8.2%), (18%) had diabetes mellitus and hypertension respectively. This result is consistent with Shin et al. [35] who reported that 71.2% of women with breast cancer had no chronic diseases.

The results of present study illustrated that the majority of the studied women had amenorrhea. This result may be due to side effect of chemotherapy, which induce ovarian follicles damage, decreased ovarian volume and finally ovarian fibrosis [36]. In the same line Yoo et al. [37] demonstrated that chemotherapy induce amenorrhea and disrupted menopause-specific quality of life in premenopausal women with breast cancer.

**Regarding physical factors**, the results of the present study revealed that women with breast cancer receiving chemotherapy were moderately affected by all over physical factors. This result is in agreement with Alzabaidey [38] who reported that women with breast cancer receiving chemotherapy had moderate affected of quality of life in regarding physical factors.

Regarding the most disturbing physical factors reported by women with breast cancer in the present study almost all studied women were highly affected by alopecia. This finding confirms the previous research that chemotherapy induced alopecia [39,40,41,42]. In addition, the current study revealed that the majority of the studied women were highly affected by feeling fatigue. This finding matched with Kim et al. [43], So et al. [44] and Devi [45], whom mentioned that fatigue, has been reported as one of the most commonly reported factor experienced by women with breast cancer receiving chemotherapy.

The present study revealed that more than half of the studied women were highly affected by general pain. This finding matched with Everdingen et al. [46] who reported that the prevalence of pain in women with breast cancer

receiving chemotherapy was (59%) and emphasized that chemotherapy related pain were regarded as the worst outcomes on HRQOL.

The current study revealed that nearly half of studied women were moderately affected by insomnia. This finding is consistent with Devi [45] and Savard et al. [47] who indicated that the prevalence of insomnia was 46% to 51.3% in women with breast cancer receiving chemotherapy. Moreover, this result comes in line with Traeger et al. [48] who reported that sleep quality remained poor condition after chemotherapy, among women with breast cancer under chemotherapy.

**Regarding central nervous system**, the present study revealed that nearly two third of studied women were moderately affected by numbness of the extremities. This finding matches with Sucala et al. [49] who reported that more than half of the studied patients complain of numbness in the extremities. In addition, the current study revealed that less than quarter of studied women were highly affected by loss of balance. This result is in the same line with Toftagen [50] who showed that chemotherapy induced peripheral neuropathy and it lead to loss of balance.

**Concerning cardiopulmonary**, the current study revealed that nearly half of the studied women were moderately affected by palpitation. This result supported by Polovich et al. [36] who explained that chemotherapy induce cardiovascular toxicity which include dysrhythmias and in some cases cardiac dysfunction cannot be linked to a specific chemotherapy but reflects the effects of a combination of chemotherapy. Furthermore, the present study revealed that more than half of the studied women were rarely affected by dyspnea. This result comes in line with Sucala et al. [49] who stated that 10.3% of the studied women were rarely affected by dyspnea.

**Regarding gastrointestinal manifestations**, this study showed that more than two third of studied women were rarely affected by vomiting and more than half of studied women were moderately affected by nausea. This was confirmed in a prior study by Farrell et al. [51] who mentioned that nausea is a troublesome and distressing factor after receiving chemotherapy and it is a more difficult factor to manage, while vomiting is well controlled with current antiemetic drugs. Furthermore, Vidal et al. [52] and Molassiotis et al. [53] reported that nausea more frequently than vomiting and its management has consequently improved significantly in recent years.

The current study revealed that around half of studied women with breast cancer were highly affected by dry mouth. This finding matches with Sucala et al. [49] who reported that more than half of women with breast cancer receiving chemotherapy complain of dry mouth. In addition, the present study revealed that around half of studied women were highly affected by anorexia. This finding supported by Almutairi et al. [54] who reported that the majority of studied women with breast cancer receiving chemotherapy had anorexia.

**Regarding sexuality**, the present study revealed that more than half of married studied women were highly affected by lack of sexual desire. This finding is in harmony with Devi [45] who reported that 66% of women with breast cancer receiving chemotherapy had alteration in sexual functioning and mentioned lack of sexual desire.

Furthermore, Kedde et al. [55] reported that 64 % had a sexual dysfunction. Moreover, Farthmann et al. [56] analyzed the effect of chemotherapy on sexual quality of life and stated that the reasons for sexual inactivity were variable, including both physical and psychological factors. Additionally, the current study revealed that nearly third of married studied women were highly affected by dyspareunia and vaginal dryness. This result supported by Rosenberg et al. [57] who illustrated that almost women with breast cancer receiving chemotherapy suffered from strong association between sexual dysfunction and both vaginal dryness and dyspareunia.

**Concerning activities of daily living**, the present study showed that more than half of the studied women with breast cancer receiving chemotherapy were highly affected by frequent bed rest. Moreover, the current study revealed that half of the studied women were moderately affected by task not completed and divided each task done of activity. This result may be due to the side effect of chemotherapy treatment induce fatigue and change level of activity of women. This finding supported by Wyatt et al. [58] who reported that the majority of the women with breast cancer face difficulties in performing activities of daily living associated with treatment interruptions.

**Regarding assessing activities in arm on surgery side**, the present study showed that nearly half of the studied women were moderately affected by washing back, closed blouse from the back, and sleeping on the affected side. In addition, the current study revealed that more than two third of the studied women were highly affected by carrying a shopping bag, pushing a heavy door, and lifting heavy objects. This is because pre-operative education for exercise and postoperative surveillance with physiotherapy intervention exercise return upper limb function and improved range of motion.

In this context, Smoot et al. [59] who explained that activity avoidance recommended may be a difficulty, as upper extremity strength may deteriorate over time with reduced use, with elbow flexion and grip strength in women with lymphedema. This result is in line with Tiezzi et al. [60] considered that the lower scores in physical factors among women with breast cancer receiving chemotherapy reflects their limitations in daily activities such as running, lifting heavy objects, walking several blocks, climbing stairs, kneeling and bathing. In addition, the author explained these limitations might be associated with changes in the muscles and nerves, which is common in women who are treated with chemotherapy.

On the other hand, the present study revealed that nearly half of the studied women with breast cancer receiving chemotherapy were moderately affected by decreased range of motion (ROM) in arm on breast surgery side. In this respect, Letellier [61] emphasized that mainly with mastectomy, the women's ability to move their limb easily in its complete ROM can be affected if damage to the nerve and muscle followed the surgery and scar tissues limit arm movement, as well as radiotherapy may lead to more scar and fibrotic tissues. This finding the same line with Springer et al. [62] who pointed that, most women undergoing breast cancer surgery who receive physiotherapy intervention may expect a return to baseline ROM and strength by three months.

**Considering lymphedema**, the present study revealed that only (10.7%) had lymphedema sign. In this line, Yarbrow et al. [63] illustrated that lymphedema is a chronic condition that occurs when the flow of lymph fluid through lymphatic vessels is impaired and the fluid accumulates in surrounding dependent tissue. This finding is congruent with Ashikaga et al. [64] who reported that lymphedema increased in breast cancer after six months, one year, and two years, at 9.4%, 11.1%, and 14% respectively.

The present study revealed that there was statistical significance difference related to age group with physical factors. This finding supported by Paskett et al. [65] who mentioned that there was statistically significant difference between the age group on Quality of life and classically was associated with lower HRQOL. Moreover, this result is in line with Ahmed et al. [66] who reported that elderly women with breast cancer reported poorer physical factors than women of ages <60 years.

**Regarding social factors**, the present study revealed that quality of life of women with breast cancer receiving chemotherapy were moderately affected by all over social factors. This result could be due to the nature of Saudi culture and the strong social and emotional support that the patients received from family and friends during the period of illness. This finding is consistent with Tiezzi et al. [60] who reported that social factors in women with breast cancer receiving chemotherapy were moderately affected.

The current study showed that the majority of the studied women with breast cancer receiving chemotherapy feeling safe in family and about half of them get support from their family. This may be attributed to the fact that social support principally from family and friends plays a very important role in creating substantial relationships with all factors affecting women's quality of life as well as the majority of studied women with breast cancer receiving chemotherapy in this study were living with their family which support them with overcome the symptoms. This finding matched with Salonen et al. [67] who stated that family support is important and the familial relationship between the patients and their family members is close. In the same line, Almutairi et al. [54] explained that most families surrounded their women with breast cancer during chemotherapy. Additionally, Gavric and Vukovic-Kostic [68] clarified that breast cancer or chemotherapy had considerably more impact on family and social life of women with breast cancer.

The current study showed that nearly half of the studied women were highly affected by their inability to meet their friends. In the same line, Al-Azri et al. [69] mentioned that many women with breast cancer prefer to share their illness with only close family members and reluctant to inform their friends. Moreover, the present study revealed that more than two third of the studied women were highly affected participating in social groups work. This finding is in the same direction with, Zhao et al. [70] and Harcourt & Frith, [71] who reported that women with breast cancer receiving chemotherapy had impaired participation in society and avoid social activities that requires interaction with people.

The current study revealed that nearly one-third were moderately affected by financial difficulties due to the

cost of treatment. This may be due to most of women did not aware government subsidy during illness. In the same line, Almutairi et al. [54] and Rohani et al. [72] reported that financial difficulties were highly prominent that both high income and low income countries.

**Regarding psychological factors**, the current study revealed that women with breast cancer receiving chemotherapy were moderately affected by all over psychological factors. These findings are in harmony with Høyer et al. [73] and Tiezzi et al. [60] who reported that breast cancer and chemotherapy have significant impact on the psychological factors of women. Moreover, this study showed that about two-third of the studied women were moderately affected by ability to enjoy their life and feeling relax. This result may be related to most of women with breast cancer under chemotherapy feeling sad about their prognosis so always not enjoy with others. This is in line with Jafari et al. [74] who mentioned that cancer patient with a higher degree of peace in their lives were able to enjoy their life. This result supported by, Pinar [75] reported that more than third women with breast cancer feeling relax. Furthermore, Shams & Al-Azri [69] stated that counsellors for women with breast receiving chemotherapy use techniques as psychotherapy, relaxation, coping skills training and education, alone or in combination to improved women's psychological factors.

The present study found that more than one third of the studied women were highly affected by feeling sad. This finding comes in line with Sucala et al. [49] who mentioned that nearly third of the studied women were highly affected by feeling sad. In same line, Elsheshtawy et al. [76] reported that there was high prevalence of sadness among Arab women with breast cancer receiving chemotherapy, as they face two major threats. The first one concerns women's life and breast cancer being the most common cause of death among women. The second threat concerns psychological image as a competent woman, particularly in relation to sexuality, femininity, body image, and maternal issues.

The current study illustrated that more than half of the studied women were moderately affected by fear and worry about their condition. This result comes in line with Alzabaidey [38] and Waters et al. [77] who reported that most women with breast cancer were fear and worry about their breast cancer progressing. Moreover this finding supported by Butow et al. [78] who explained that when women are confronted with a health threat, an illness representation is activated, consisting of cognition and emotions about illness.

The current study revealed that about nearly half of studied women were highly affected by their appearance as well as near two third of studied women were highly affected by feeling less physically attractive. This finding supported by Rugo et al. [79] and Choi et al. [80] who reported that half of studied women had chemotherapy-induced alopecia distress and it was negatively associated with body image and physically attractiveness.

The present study found that near two third of the studied women were rarely affected by avoid being with people because their appearance. There was noticed that during data collection women emphasized that they had affected by change in their appearance but they still had self-confidence and not hesitate to engage with other people because their appearance. This finding is congruent

with Assaf [81] and Williams & Jeanetta [82] who reported that women with breast cancer had to cope with changes in their aberrance.

**Regarding spiritual factors**, the present study revealed that women with breast cancer receiving chemotherapy were moderately affected by all over spiritual factors. This result is in agreement with Aghakhani et al. [83] who emphasized that spiritual factors were moderately affected women' QOL and suggested that religious and spiritual factors could effectively promote the optimism of women with breast cancer.

**Regarding self-awareness**, the present study revealed that the majority of the studied women were highly affected by trusting in God and empathy with others. In Saudi culture, where pure religion of Islam, people believe fate and God's will, this belief conveys more acceptance of challenges a combined with breast cancer disease. This result in the same line with Yanez et al. [84] who described that faith was uniquely related to perceived positive life changes following a cancer diagnosis. Moreover, regarding this finding is matched with Carr et al. [85] who reported that some women with breast cancer remain connected to their faith in God which give them strength and comfort.

The present study showed that near two-third of the studied women were highly affected by found meaning in difficult situation. In Islam, struggling and calamities consider a sign of God love. Therefore, Muslims believe that acceptance is the beginning of the journey against breast cancer. This result supported by, Yanez et al. [84] who described that spirituality is an inner peace subjective experience that makes people feel a strong interest in understanding the meaning of things in life. Therefore, they may not have had much time to think about meaning in difficult situation after breast cancer and chemotherapy treatment.

The current study found that near two-third of the studied women were rarely affected by loneliness. Because as mentioned before, women insist to engage with other people, however their illness. Moreover, this may be due to religious participation stimulated a positive emotion in women with breast cancer and this contributed to their body relaxation, spiritual and mental well-being. Thus, women can cope with the disease actively and optimistically. This result is in line with, Tsai et al. (2016) who reported that religion helps patients compensate with the feeling of helplessness and promotes health recovery with hope, confidence, and optimism.

**Considering spiritual practices**, the present study found that the majority of the studied women were moderately affected by thinking to achieve inner peace and any opportunity to enhance spirituality condition. People practicing Islam have acceptance of their illness and coping effectively. This result in line with Jafari et al. [86] and Yanez et al. [87] who emphasized that the capability to find meaning and achieved inner peace in life is more powerful contributor to favorable adjustment during chemotherapy.

**Regarding spiritual needs**, the current study found that the majority of studied women with breast cancer receiving chemotherapy were highly affected by listening to Holy Qur'an. This finding may be attributed to the fact of the Muslim Holy Qur'an involves all parts of life and sources of strength. This result is in line with Mirghafourvand spiritual music, which enhance the secretion of endorphins via the brain and stimulating alpha waves which interns,

alleviates women's anxiety, improve a sense of relaxation and enhances immune system. In this context, El-Shatby et al. [88] maintained listening Qur'an reproduce strong faith that spiritual support can relieving of the problem were highly satisfied with their faith in Allah and supposed that illness is not a punishment but rather exam of their religious commitment.

**Concerning the overall QOL level**, the current study revealed that women with breast cancer receiving chemotherapy had moderate level regarding overall QOL. This finding is reasonable considering the women in the study have moved from a state of health to confronting the reality of a health problem with ongoing chemotherapy treatment. This result is in line with Musarezaie, et al. [87] who showed that level of QOL in women with breast cancer under chemotherapy was moderate.

**Regarding relation between factors affecting health and the QOL level**, the current study illustrated that there was statistically significant negative relationship between overall factors affecting health and overall QOL of women with breast cancer receiving chemotherapy. This is in line with Begum et al. [89] who showed that there were a statistically significant negative relationship among factors affecting health and QOL.

Moreover, the present study revealed that there was statistically significant negative relationship between psychological factors and overall QOL level of women with breast cancer. This finding is consistent with Sharif [90] who mentioned that there was a significant negative association between QOL and psychological factors. In contrast, [91] mentioned that there was a positive association between QOL for women with breast cancer and psychological distress is well recognized.

Concerning relationship between demographic and clinical characteristics with factors affecting health related quality of life, the present study revealed that there was statistically significance difference regarding age group with physical factors, in which elderly women above 60 years old had affected by physical factors than under 60 years old. This finding supported by Paskett et al. [65] who mentioned that there was statistically significant difference between the age group on QOL.

Considering grade of breast cancer the current study showed that there was statistically significance difference between stages of breast cancer and psychological factors in which women in grade III affected by psychological factors more than grade I & II. This finding supported by Al-Naggar et al. [92] who mentioned that there was statistically significant association histological grade of breast cancer with psychological factors.

Finally, nurses play an important role in the assessment of physical, social, psychological and spiritual factors for women with breast cancer receiving chemotherapy. Therefore, nurses should integrate assessment into their routine general practice activity. Furthermore, the nurse must provide information to women with breast cancer and educating them about these side effects.

## 7. Conclusions

In conclusion, the majority of studied women with breast cancer receiving chemotherapy had moderately

affected by overall social factors and nearly two third had moderately affected by overall psychological factors. While more than half were moderately affected by overall physical and spiritual factors. Moreover, women with breast cancer receiving chemotherapy had moderate level of overall QOL. There was statistically significant negative relationship between overall factors affecting health and overall women' QOL. In addition, there was negative relationship between psychological factors and overall quality of life level. There was statistically significance difference between age group and physical factors.

## 8. Recommendations

- Developing assessment guidelines and management booklet about the side effects of chemotherapy.
- Establishing self-care practices educational program about the side effects of chemotherapy and how to manage it.
- Further researches are needed to get a better understanding of women perception, attitude and practice regarding chemotherapy side effects.

## References

- [1] Siegel, R. L., Miller, K. D., & Jemal, A. (2016). Cancer statistics, 2016. *CA Cancer J Clin*, 66(1), 7-30.
- [2] Saudi Cancer Registry (2016). Cancer Incidence Report Saudi Arabia 2013. [www.chs.gov.sa/Ar/.../CancerRegistry/CancerRegistryReports/2013.p...](http://www.chs.gov.sa/Ar/.../CancerRegistry/CancerRegistryReports/2013.p...)
- [3] El Bcheraoui, C., Basulaiman, M., Wilson, S., Daoud, F., Tuffaha, M., AlMazroa, M. A., et al. (2015). Breast Cancer Screening in Saudi Arabia: Free but Almost No Takers. *PLoS ONE*, 10(3), 1-10.
- [4] Chong, H. K., Wang, T., Lu, H.-M., Seidler, S., Lu, H., Keiles, S., et al. (2014). The validation and clinical implementation of BRCAPlus: a comprehensive high-risk breast cancer diagnostic assay. *PLoS ONE*, 9(5), e97408.
- [5] Gradishar, W. J., Anderson, B. O., Balassanian, R., Blair, S. L., Burstein, H. J., Cyr, A., et al. (2015). Breast cancer version 2.2015. *Journal of the National Comprehensive Cancer Network*, 13(4), 448-475.
- [6] Brunton, L. L., Chabner, B., & Knollmann, B. C. (2011). *Goodman & Gilman's the pharmacological basis of therapeutics* (Vol. 12): McGraw-Hill Medical New York.
- [7] Chopra, D., Rehan, H. S., Sharma, V., & Mishra, R. (2016). Chemotherapy-induced adverse drug reactions in oncology patients: A prospective observational survey. *Indian Journal of Medical & Paediatric Oncology*, 37(1), 42-46.
- [8] Howlader, N., Sherman, R. L., Kohler, B., Jemal, A., Ryerson, A. B., Henry, K. A., et al. (2015). Annual report to the nation on the status of cancer, 1975-2011, featuring incidence of breast cancer subtypes by race/ethnicity, poverty, and state. *Journal of the National Cancer Institute*, 107(6), djv048.
- [9] Yarbro, C. H., Wujcik, D., & Gobel, B. H. (2014). *Cancer nursing: Principles and practice*: Jones & Bartlett Publishers.
- [10] Williams, A. (2012). Living with and beyond breast cancer. *Journal of Community Nursing*, 26(1), 6.
- [11] Evangelista, A. L., Santos, E. M. M., do Socorro Maciel, M., Bocalini, D. S., Rica, R. L., Costa, E. F., et al. (2016). Associations of quality of life, physical activity and mood states in women with breast cancer treated with curative intent. *Applied Research in Quality of Life*, 11(2), 445-459.
- [12] Fayers, P. M., & Machin, D. (2007). Principles of Measurement Scales *Quality of Life* (pp. 31-48): John Wiley & Sons, Ltd.
- [13] Ferrans, C. E., Zerwic, J. J., Wilbur, J. E., & Larson, J. L. (2005). Conceptual Model of Health-Related Quality of Life. *Journal of Nursing Scholarship advancing knowledge to improve health of the world's people*, 37(4), 336-342.

- [14] Bayram, Z., Durna, Z., & Akin, S. (2014). Quality of life during chemotherapy and satisfaction with nursing care in Turkish breast cancer patients. *European Journal of Cancer Care*, 23(5), 675-684
- [15] STEWART, B. W., & WILD, C. P. (2014). World cancer report 2014. <http://public.eblib.com/choice/publicfullrecord.aspx?p=1978030>.
- [16] Alghamdi, I. G., Hussain, I. I., Alghamdi, M. S., & El-Sheemy, M. A. (2013). The incidence rate of female breast cancer in Saudi Arabia: an observational descriptive epidemiological analysis of data from Saudi Cancer Registry 2001-2008. *Breast Cancer: Targets and Therapy*, 5, 103.
- [17] Berger, A. M., Kuhn, B. R., Farr, L. A., Lynch, J. C., Agrawal, S., Chamberlain, J., et al. (2009). Behavioral therapy intervention trial to improve sleep quality and cancer-related fatigue. *Psycho-Oncology*, 18(6), 634-646.
- [18] Moulder, S., & Hortobagyi, G. (2008). Advances in the treatment of breast cancer. *Clinical Pharmacology & Therapeutics*, 83(1), 26-36.
- [19] Blow AJ, Swiecicki P, Haan P, Osuch JR, Symonds LL, Smith SS, et al. The emotional journey of women experiencing a breast abnormality. *Qualitative health research*. 2011; 21(10): 1316-34.
- [20] Avis NE, Crawford S, Manuel J. Quality of life among younger women with breast cancer. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2005; 23(15): 3322-30.
- [21] Richardson LC, Wang W, Hartzema AG, Wagner S. The role of health-related quality of life in early discontinuation of chemotherapy for breast cancer. *Breast Journal*. 2007; 13(6): 581-7. 7p.
- [22] DiSipio T, Hayes S, Battistutta D, Newman B, Janda M. Patterns, correlates, and prognostic significance of quality of life following breast cancer. *Psycho-Oncology*. 2011; 20(10): 1084-91.
- [23] Cheng, S.-Y., Lai, Y.-H., Chen, S.-C., Shun, S.-C., Liao, Y.-M., Tu, S.-H., et al. (2012). Changes in quality of life among newly diagnosed breast cancer patients in Taiwan. *Journal of Clinical Nursing*, 21(1/2), 70-79.
- [24] Ware JE, Snow KK, Kosinski M, Gandek B. SF-36 Health Survey : Manual and Interpretation Guide. Boston: New England Medical Center. The Health Institute; 1993.
- [25] Ware, J. E. J. P., & Sherbourne, C. D. P. (1992). The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection. *Medical Care*, 30(6), 473-483.
- [26] Evangelista, A. L., & Santos, E. M. (2012). Cluster of symptoms in women with breast cancer treated with curative intent. *Supportive Care in Cancer*, 20(7), 1499-1506.
- [27] Liu, L., Fiorentino, L., Rissling, M., Natarajan, L., Parker, B. A., Dimsdale, J. E., et al. (2013). Decreased health-related quality of life in women with breast cancer is associated with poor sleep. *Behavioral Sleep Medicine*, 11(3), 189-206.
- [28] Lim, J.-w., & Ashing-Giwa, K. T. (2013). Is family functioning and communication associated with health-related quality of life for Chinese-and Korean-American breast cancer survivors? *Quality of Life Research*, 22(6), 1319-1329.
- [29] Warkentin, L. M., Majumdar, S. R., Johnson, J. A., Agborsangaya, C. B., Rueda-Clausen, C. F., Sharma, A. M., et al. (2014). Weight loss required by the severely obese to achieve clinically important differences in health-related quality of life: two-year prospective cohort study. *BMC medicine*, 12(1), 175.
- [30] Chong HK, Wang T, Lu H-M, Seidler S, Lu H, Keiles S, et al. The validation and clinical implementation of BRCAPlus: a comprehensive high-risk breast cancer diagnostic assay. *PLoS one*. 2014; 9(5): e97408.
- [31] Frempong-Ainguah F, Hill A. Reliability, validity and responsiveness of the short form-36 health survey: Findings from the women's health study of Accra, Ghana. 2014. 7-29 p.
- [32] Nicola Davies, EG, AM, RF. Patient-reported Outcome Measurement Group, Oxford. 2009.
- [33] Haddou Rahou B, El Rhazi K, Ouasmani F, Nejari C, Bekkali R, Montazeri A, et al. Quality of life in Arab women with breast cancer: a review of the literature. *Health Qual Life Outcomes*. 2016; 14: 64.
- [34] Pecorino L. Molecular biology of cancer: mechanisms, targets, and therapeutics. 4th edition ed: Oxford university press; 2014.
- [35] Shin HW, Noh DY, Lee ES, Nam SJ, Park BW, Ahn SH, et al. Correlates of existential well-being and their association with health-related quality of life in breast cancer survivors compared with the general population. *Breast Cancer Res Treat*. 2009; 118(1): 139-50.
- [36] Polovich, Olen, & LeFevre. (2014). *chemotherapy and biotherapy guidelines and recommendation for practice b*.
- [37] Yoo, C., Yun, M., Ahn, J.-H., Jung, K., Kim, H., Kim, J., et al. (2013). Chemotherapy-induced amenorrhea, menopause-specific quality of life, and endocrine profiles in premenopausal women with breast cancer who received adjuvant anthracycline-based chemotherapy: a prospective cohort study. *Cancer Chemotherapy & Pharmacology*, 72(3), 565-575.
- [38] Jaber Alzabaidey F. Quality of Life Assessment for Patients with Breast Cancer Receiving Adjuvant Therapy. 2012. 51-5 p.
- [39] Campos-Gomez, S., Claudis-Morales, N., Campos-Gómez, K., Olivares-Mendoza, B., García-Garcés, M., & Rojas-Cruz, L. (2016). Abstract P1-11-05: Chemotherapy-induced alopecia prevention and effects on quality of life among women with breast cancer: A study of a scalp-cooling system used in a Mexican public hospital: AACR.
- [40] Javeth, A., Mathur, R., & Babu, M. (2017). A correlational survey to assess the level of stress, coping strategies, and quality of life of female cancer patients related to chemotherapy induced alopecia in Amala Cancer Hospital, Thrissur, Kerala. *Asian Journal of Nursing Education and Research*, 7(1), 1.
- [41] Jayde, V., Boughton, M., & Blomfield, P. (2013). The experience of chemotherapy-induced alopecia for Australian women with ovarian cancer. *European Journal of Cancer Care*, 22(4), 503-512.
- [42] Nangia, J., Wang, T., Osborne, C., Niravath, P., Otte, K., Papish, S., et al. (2017). Effect of a scalp cooling device on alopecia in women undergoing chemotherapy for breast cancer: the SCALP randomized clinical trial. *Jama*, 317(6), 596-605.
- [43] Kim, S. H., Son, B. H., Hwang, S. Y., Han, W., Yang, J.-H., Lee, S., et al. (2008). Fatigue and depression in disease-free breast cancer survivors: prevalence, correlates, and association with quality of life. *Journal of pain and symptom management*, 35(6), 644-655.
- [44] So, W. K. W., Marsh, G., Ling, W. M., Leung, F. Y., Lo, J. C. K., Yeung, M., 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. *Oncology Nursing Forum*, 36(4), E205-E214.
- [45] Devi, M. K. (2016). *Quality of life and psychosocial status of women with early-stage breast cancer*.
- [46] van den Beuken-van Everdingen MH, de Rijke JM, Kessels AG, Schouten HC, van Kleef M, Patijn J. Prevalence of pain in patients with cancer: a systematic review of the past 40 years. *Annals of oncology: official journal of the European Society for Medical Oncology*. 2007; 18(9): 1437-49.
- [47] Savard, J., Ivers, H., Savard, M.-H., & Morin, C. M. (2015). Cancer treatments and their side effects are associated with aggravation of insomnia: Results of a longitudinal study. *Cancer*, 121(10), 1703-1711.
- [48] Traeger, L., McDonnell, T. M., McCarty, C. E., Greer, J. A., El-Jawahri, A., & Temel, J. S. (2015). Nursing intervention to enhance outpatient chemotherapy symptom management: Patient-reported outcomes of a randomized controlled trial. *Cancer*, 121(21), 3905-3913.
- [49] Sucala, M., Petrisor, C., Achimas-Cadariu, P., & David, D. (2014). Predictors of Quality of Life during chemotherapy for breast cancer. Investigating the role of multidimensional symptoms and dysfunctional beliefs. *Journal of Evidence-Based Psychotherapies*, 14(2), 137.
- [50] Toftagen, C. (2010). Patient perceptions associated with chemotherapy-induced peripheral neuropathy. *Clinical Journal of Oncology Nursing*, 14(3).
- [51] Farrell, C., Brearley, S. G., Pilling, M., & Molassiotis, A. (2013). The impact of chemotherapy-related nausea on patients' nutritional status, psychological distress and quality of life. *Supportive Care in Cancer*, 21(1), 59-66.
- [52] Vidall, C., Sharma, S., & Amlani, B. (2016). Patient-practitioner perception gap in treatment-induced nausea and vomiting. *British Journal of Nursing*, 25(16).
- [53] Molassiotis A, P Saunders M, Valle J, Wilson G, Lorigan P, Wardley A, et al. A prospective observational study of chemotherapy-related nausea and vomiting in routine practice in a UK cancer centre 2008. 201-8 p.

- [54] Almutairi, K., Mansour, E., & Vinluan, J. (2016). A cross-sectional assessment of quality of life of breast cancer patients in Saudi Arabia. *Public Health*, 136, 117-125.
- [55] Kedde, H., Van de Wiel, H., Schultz, W. W., & Wijnen, C. (2013). Sexual dysfunction in young women with breast cancer. *Supportive Care in Cancer*, 21(1), 271-280.
- [56] Farthmann, J., Hanjalic-beck, A., Veit, J., Rautenberg, B., Stickeler, E., Erbes, T., et al. (2016). The impact of chemotherapy for breast cancer on sexual function and health-related quality of life. *Supportive Care in Cancer*, 24(6), 2603.
- [57] Rosenberg, S. M., Tamimi, R. M., Gelber, S., Ruddy, K. J., Bober, S. L., Kerekoglow, S., et al. (2014). Treatment-related amenorrhea and sexual functioning in young breast cancer survivors. *Cancer*, 120(15), 2264-2271.
- [58] Wyatt G, Sikorskii A, Tesnjak I, Victorson D, Srkalovic G. Chemotherapy interruptions in relation to symptom severity in advanced breast cancer. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2015; 23(11): 3183-91.
- [59] Smoot, B., Wong, J., Cooper, B., Wanek, L., Topp, K., Byl, N., et al. (2010). Upper extremity impairments in women with or without lymphedema following breast cancer treatment. *Journal of cancer survivorship*, 4(2), 167-178.
- [60] Tiezzi, M. F. B., de Andrade, J. M., Romão, A. P. M. S., Tiezzi, D. G., Leri, M. R., Carrara, H. A. H., et al. (2017). Quality of Life in Women With Breast Cancer Treated With or Without Chemotherapy. *Cancer Nursing*, 40(2), 108-116.
- [61] Letellier, M.-E. (2016). *The impact of breast cancer and its treatment on arm dysfunction and quality of life*. McGill University Libraries.
- [62] Springer, B. A., Levy, E., McGarvey, C., Pfalzer, L. A., Stout, N. L., Gerber, L. H., et al. (2010). Pre-operative assessment enables early diagnosis and recovery of shoulder function in patients with breast cancer. *Breast Cancer Research and Treatment*, 120(1), 135-147.
- [63] Yarbrow, C. H., Wujcik, D., & Gobel, B. H. (2011). *Cancer nursing: Principles and practice*: Jones & Bartlett Publishers.
- [64] Ashikaga, T., Krag, D. N., Land, S. R., Julian, T. B., Anderson, S. J., Brown, A. M., et al. (2010). Morbidity results from the NSABP B-32 trial comparing sentinel lymph node dissection versus axillary dissection. *Journal of surgical oncology*, 102(2), 111-118.
- [65] Paskett, E., Herndon, J., Donohue, K., Naughton, M., Grubbs, S., Pavy, M., et al. (2009). Health-related quality of life in long-term breast cancer survivors. *Cancer*, 115(5), 1109-1120.
- [66] Ahmed, A. E., Alharbi, A. G., Alsadhan, M. A., Almuzaini, A. S., Almuzaini, H. S., Ali, Y. Z., et al. (2017). The predictors of poor quality of life in a sample of Saudi women with breast cancer. *Breast Cancer (Dove Med Press)*, 9, 51-58.
- [67] Gavric, Z., & Vukovic-Kostic, Z. (2016). Assessment of quality of life of women with breast cancer. *Global Journal of Health Science*, 8(9), 1.
- [68] Salonen, P. P., Tarkka, M.-T. P. R. N., Kellokumpu-Lehtinen, P.-L. M. D., Koivisto, A.-M. M., Aalto, P. P., & Kaunonen, M. P. R. N. (2013). Effect of social support on changes in quality of life in early breast cancer patients: a longitudinal study. *Scandinavian Journal of Caring Sciences*, 27(2), 396-405.
- [69] Shams, N., & Al-Azri, M. (2016). The Need for Psychological Interventional Supportive Services for Omani Women Diagnosed with Breast Cancer. *Sultan Qaboos University Medical Journal*, 16(4), e403.
- [70] Zhou L, Zhang P, Zimmermann H-D. Social commerce research: An integrated view. *Electronic Commerce Research and Applications*. 2013; 12(2): 61-8.
- [71] Harcourt D, Frith H. Women's experiences of an altered appearance during chemotherapy: an indication of cancer status. *Journal of health psychology*. 2008; 13(5): 597-606.
- [72] Rohani, C., Abedi, H.-A., Sundberg, K., & Langius-Eklöf, A. (2015). Sense of coherence as a mediator of health-related quality of life dimensions in patients with breast cancer: a longitudinal study with prospective design. *Health & Quality of Life Outcomes*, 13, 1-9.
- [73] Høyer, M., Johansson, B., Nordin, K., Bergkvist, L., Ahlgren, J., Lidin-Lindqvist, A., et al. (2011). Health-related quality of life among women with breast cancer-a population-based study. *Acta Oncologica (Stockholm, Sweden)*, 50(7), 1015-1026.
- [74] Jafari N, Zamani A, Farajzadegan Z, Bahrami F, Emami H, Loghmani A. The effect of spiritual therapy for improving the quality of life of women with breast cancer: A randomized controlled trial. 2012.
- [75] Pinar, G. (2012). Feelings and Spiritual Practices of Patients with Mastectomy: A Qualitative Study from Turkey. *Journal of Cancer Therapy*, 3(05), 793.
- [76] Elsheshtawy, E., Aboelez, W., Ashour, H., Elbahaey, W., & Farouk, O. (2015). Anxiety and Depression in Female Patients with Breast Cancer: A Study of Predictors. *Instruction to Authors*, 26(1), 49-58.
- [77] Waters, E. A., Liu, Y., Schootman, M., & Jeffe, D. B. (2012). Worry about cancer progression and low perceived social support: implications for quality of life among early-stage breast cancer patients. *Annals of Behavioral Medicine*, 45(1), 57-68.
- [78] Butow, P. N., Fardell, J., & Smith, A. (2015). Fear of cancer recurrence: an overview and Australian perspective.
- [79] Rugo, H. S., Klein, P., Melin, S. A., Hurvitz, S. A., Melisko, M. E., Moore, A., et al. (2017). Association between use of a scalp cooling device and alopecia after chemotherapy for breast cancer. *Jama*, 317(6), 606-614.
- [80] Choi, E. K., Kim, I. R., Chang, O., Kang, D., Nam, S. J., Lee, J. E., et al. (2014). Impact of chemotherapy-induced alopecia distress on body image, psychosocial well-being, and depression in breast cancer patients. *Psycho-Oncology*, 23(10), 1103-1110.
- [81] Assaf, G. N. (2011). A Two-Stage Exploratory Study of the Coping Patterns of Arab Women with Breast Cancer Residing in the United Arab Emirates. Retrieved from A Two Stage Exploratory Study of the Coping Patterns of ... <https://researchbank.rmit.edu.au/eserv.php?pid=rmit:160065&dsID=Assaf.pdf>.
- [82] Williams, F., & Jeanetta, S. C. (2016). Lived experiences of breast cancer survivors after diagnosis, treatment and beyond: qualitative study. *Health expectations*, 19(3), 631-642.
- [83] Aghakhani, N., Akbari, M., Abbasi, M., Naderi, J., Cheraghi, R., Ayremloo, M., et al. (2016). Evaluation of the spiritual health of cancer patients and their nurses in Iran.
- [84] Yanez, B., Edmondson, D., Stanton, A. L., Park, C. L., Kwan, L., Ganz, P. A., et al. (2009). Facets of spirituality as predictors of adjustment to cancer: relative contributions of having faith and finding meaning. *Journal of consulting and clinical psychology*, 77(4), 730.
- [85] Carr-Gregg, M., & Manocha, R., (2011). Bullying: Effects, prevalence and strategies for detection. *Australian Family Physician*, 40, 98-102.
- [86] Jafari N, Zamani A, Farajzadegan Z, Bahrami F, Emami H, Loghmani A. The effect of spiritual therapy for improving the quality of life of women with breast cancer: a randomized controlled trial. *Psychology, health & medicine*. 2013; 18(1): 56-69.
- [87] Musarezaie, A., Ghasemi, T. M. G., & Esfahani, H. N. (2012). Investigation the quality of life and its relation with clinical and demographic characteristics in women with breast cancer under chemotherapy. *International journal of preventive medicine*, 3(12), 853.
- [88] Moursy AM El-Shatby, Ead AYS. Self care practices of chemotherapy patients. *Life Science Journal*. 2014;11(4):212-22.
- [89] Begum, M. S. N., Petpichetchian, W., & Kitrungrate, L. (2016). Symptom Experience and Quality of Life of Patients with Breast Cancer Receiving Chemotherapy in Bangladesh. *Bangladesh Journal of Medical Science*, 15(2), 201.
- [90] Sharif, S. P. (2017). Locus of control, quality of life, anxiety, and depression among Malaysian breast cancer patients: The mediating role of uncertainty. *European Journal of Oncology Nursing*, 27, 28-35.
- [91] Budden, L. M., Hayes, B. A., & Buettner, P. G. (2014). Women's decision satisfaction and psychological distress following early breast cancer treatment: a treatment decision support role for nurses. *International Journal of Nursing Practice*, 20(1), 8-16.
- [92] Al-Naggar, R. A., Nagi, N. M. S., Ali, M., & Almuasli, M. (2011). Quality of life among breast cancer patients in Yemen. *Asian Pac J Cancer Prev*, 12(9), 2335-2341.

