

## Assessment of Fatigue and Its Associated Factors in Breast Cancer Patients Under Treatment

Research Article

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## Abstract

Fatigue is a common distressing problem in most breast cancer patients. It may be caused by the disease, the complications of the disease and its treatments. This study aimed to assess fatigue and associated factors in breast cancer patients receiving chemotherapy. A descriptive study was conducted on 100 patients from April 2011 to Aug.2011 in King Hussein Cancer Center. Fatigue Symptoms Inventory (FSI) scale was used for assessment of fatigue containing four subscales, other questions were concerning the socio-demographic data, the clinical information and the physical symptoms. Descriptive statistics, mean and standard deviation, chi-square and ANOVA test were used for data analysis. The result of this study declared the highest total mean score of fatigue subscale was (4.54 ± 2.50) for frequency of fatigue in last week, and a high mean score of fatigue (4.42 ± 2.86) was for the subscale of fatigue interferes with activity for the past week, while the lowest mean score was for the daily pattern of fatigue (2.93 ± 1.335).

Concerning the fatigue severity, the highest percentages (36%) of patients had moderate fatigue. In conclusion, fatigue is a significant problem for patients with breast cancer receiving chemotherapy although its severity is relatively different according to various variables.

**Keywords:** Breast Cancer; Fatigue; Chemotherapy.

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## Introduction

Breast cancer is the most common cause of cancer-related deaths among women worldwide [1, 2]. It accounts for 31% of cancers among women, and 19% of deaths among women are due to cancer [3]. Epidemiological data showed that one in 8 women in the United States of America and one in 10 women in Europe [3,4,5] will develop breast cancer at some time during their lives in Jordan, breast cancer is the most common cancer for females, accounting for 35% of all female cancer. The rank order of the five most common cancers affecting Jordanians are: Breast, Colo-Rectal, Lung, Lymphoma, and Leukemia. The crude incidence rate of all cancer among Jordanians was 67.1 per 100,000 populations (63.9 for males and 70.5 for females) [6].

Fatigue is a subjective sensation with physical, cognitive, and affective modes of expression. The etiology is often unclear & multiple potential etiologic factors for fatigue may coexist. It is also involves characterizing its severity, temporal features, exacerbating and relieving factors, associated distress. Fatigue is the most common and disturbing complaint reported by women during adjuvant breast cancer chemotherapy, but little

is known about the mechanisms influencing it [7, 8].

Fatigue is difficult to describe, and the people with cancer may express it such as, saying they feel tired, weak, exhausted weary, and worn out. Several definitions are used to describe cancer related fatigue, it is defined by the National Comprehensive Cancer Network (NCCN) as "a persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning" [9].

Fatigue is one of many symptoms seen in patients with breast cancer and both clinical experience and clinical studies declared that it was one of the most common unrelieved symptoms of cancer treatment [10]. Potential factors contributing to fatigue in cancer patients are the cancer itself, cancer treatment, cancer or treatment complications, medications and other management [11].

Many studies examined the prevalence of fatigue among breast cancer patients they found that about (99 %) of patients were experienced some level of fatigue during the course of chemotherapy treatment and more than (60%) were rated their level of fatigue as moderate to severe [12]. Saface et al. [13] found that (78%) of patients were experienced fatigue to some extent and the mean score was 41.74+26.91.

Because there are so many causes of fatigue, there's no one medicine that can relieve fatigue. However, Fatigue from treatment can appear suddenly, at any time, and can be overwhelming. Rest doesn't ease fatigue and it can last for months after treatment ends [14, 15]. Moreover, fatigue may become very important issue in the life of a patient with breast cancer and affect her daily activities and relationships with others, patient may miss work, withdraw friends, and not able to think clearly. Therefore, understanding the magnitude of fatigue and its causes is important in determining effective management and helping patients to cope with fatigue. [16, 17]

The majority of past researches were conducted either North America or North European countries, little is known about assessment of fatigue and the use of fatigue assessment scales in Middle East, therefore this study attempt to identify the magnitude of fatigue related to breast cancer in patients who were under chemotherapy treatment and factors that

associated with fatigue

## Materials and Methods

### Aim of the study

The current study was conducted to evaluate the magnitude of fatigue in breast cancer patients who were under chemotherapy treatment and factors that associated with fatigue.

### Study design & setting

A descriptive study was carried out on patients fulfilling the criteria of the study, during the period of April 2011 to Aug.2011. They were choosing at selected room in outpatient ward for chemotherapy administration, in the department of Oncology in king Hussein Cancer Center (KHCC). The KHCC is a medical, non-governmental and nonprofit organization center in Amman city, the capital of Hashemite king Jordan. This center was selected because it is specialized in oncology and is a referral center in king Hashemite.

### Subjects

The sample consisted of all female patients had a current diagnosis of stage 2 or 3 of breast cancer and under chemotherapy treatment (receiving three or more cycles) because patients who received first cycle of treatment had lower scores of fatigue than the patients who had 3 cycles of treatment [18, 19, 20].

The exclusion criteria were: recurrence of cancer, other malignancy, cancer diagnosis less than 3 months, chronic disease (hypothyroidism, hyperthyroidism, hypertension and /or diabetes mellitus), pregnant women, and age less than 18 years were excluded.

### Instrumentation

A structured questionnaire was developed to assess socio-demographic data, which contain (age, educational level, occupation, marital status and financial status), data about clinical information (stages of disease, cycles of chemotherapy and hemoglobin level) obtained from patients records (Medical Report Department) by the chart reviewers who were granted by Institutional Review Board (Part I). The physical symptoms were assessed by asking the respondents to choose the symptoms which were suffering from them (Part II).

Fatigue was assessed with the Fatigue symptoms inventory (FSI): an instrument widely used by various studies [21, 22, 23] (Part III). The English version of instrument has previously been validated [24]. "The FSI is a 14-item that is comprised of subscales to severity, frequency, and diurnal variation of fatigue, as well as its perceived interference with quality of life. The first four items of the scale asked the subjects to rate the severity of fatigue in the past week. Seven items that assess the degree to which fatigue interfere with general level of activity, ability to bathe and dress, ability to concentrate, relations with others, enjoyment of life, and mood. Two items using to assess the frequency of fatigue in the past weeks that respondents felt as well as the portion of each day on average they felt fatigued. Diurnal variation is measured using a single item that provides descriptive information about daily patterns of fatigue by using 4 points rating scale [23, 25, 26]. A patient self report of fatigue severity was rated according to Jacobsen 2004 [26] he rated mild fatigue was 1-3, moderate fatigue that was 4-6, and severe fatigue was 7-10.

For the purpose of the current study, FSI scale was translated into Arabic language then back-translated into English language to ensure that the Arabic translation was the same as of English version. The translation was carried out by the linguistic professionals from Zarqa University, Hashemite king Jordan. In addition, the translation was applied to health professional for evaluation. A pilot study was carried out on ten patients to assessing feasibility of the study and the time required for completing the questionnaire. The questionnaires were reviewed by the IRB committee of KHCC. Reliability of the questionnaire were  $r = 0.87$ .

A verbal self-reports questionnaire was completed by a research assistant (who was trained to collect the data and granted by IRB) through face-to-face interview, and after obtained written consent from eligible women. The questionnaires were completed anonymously and took about 15-20 minutes for completion.

### Ethical Consideration

Approval to carry out the study was obtained through a formal letter from the director of faculty of nursing and precedence of Zarqa University. The study protocol has been approved in IRB of king Hussein Cancer Center. All patients provided a written formal consent prior to enrollment in this study, and all of them agreed to participate in this study. The obtained information and data was confidential.

### Statistical Consideration

All data was coded and entered into the computer. The statistical analysis was performed by using Statistical Packages for Social Sciences (SPSS) version 11. the information were first analyzed with descriptive methods: number, frequency and distributions were studied. ANOVA and Chi-square tests were used to analyze the relationships between variables. P values less 0.05 were interpreted as statistically significant.

## Results

Table 1 illustrated the rating of fatigue severity, interference of fatigue with activity, frequency and diurnal variation of fatigue. The highest total mean score of fatigue subscale was  $(4.54 \pm 2.50)$  for frequency of fatigue in last week, and a high mean score of fatigue  $(4.42 \pm 2.86)$  was for the subscale of fatigue interferes with activity for the past week which caused impairment in quality of life in the study group, While the lowest mean score was for the daily pattern of fatigue  $(2.93 \pm 1.335)$ .

Table (2) showed that most of the patient's ages were more than 40 years old, range between 30-60 years. In addition more than half (65%) of the studied group were married with poor financial status 62%. The same table also declared the Correlation between characteristics of the study participants & fatigue subscales. It indicated that a significant relation between fatigue subscales (severity of fatigue & diurnal) and marital status ( $p=0.08$  and  $p= 0.05$ ) respectively. A high significant relationship between hemoglobin Level and the diurnal subscale of fatigue ( $P=0.01$ ). In addition, there were significant relationships between the duration of disease and the fatigue subscales (severity, frequency, and fatigue interference with daily activity) ( $P=0.04$ ), ( $p=0.01$ ) and ( $p= 0.00$ ) respectively. Regarding the fatigue severity, the highest percentages (36%) of patients had moderate fatigue; however, the same percentages (32%) were found for mild and sever fatigue.

Table 3 showed that thirty patients who had physical symptoms "weakness" suffered from sever fatigue, while the lowest number of patients (14) were suffered from sever fatigue had arm symptoms . The relationship between fatigue subscales and the presences of physical symptoms were examined in table 4. It can be noticed that a significant relationship between physical symptoms and fatigue. The result illustrated that a significant relation between pain and most of fatigue subscales (fatigue severity ( $p= 0.01$ ), fatigue interference with daily activity ( $p= 0.01$ ) and frequency of fatigue ( $p= 0.01$ ). Most of the fatigue subscales were associated with arm symptoms, there were high significant relationships between this disorder and the severity of fatigue ( $p= 0.03$ ), fatigue interference with daily activity ( $p= 0.03$ ), and frequency of fatigue ( $p=0.00$ ). The same table showed that general weakness was associated with the fatigue severity, fatigue interference with activity and frequency of fatigue ( $p= 0.01$ ,  $p= 0.01$  and  $p= 0.01$ ) respectively. However, only one category of fatigue subscale (the frequency) were significant with soreness of mouth and dyspnea ( $p= 0.02$ ) and ( $p= 0.03$ ) respectively. Moreover there was a high significant relation between the subscale of fatigue diurnal and diarrhea ( $p=0.00$ ). The prevalence of main physical symptoms experiences by breast cancer patients were shown in figure (1). The majority of the study sample were complaining from hair loss and general weakness

Table 1: Mean and Stander Deviation of fatigue subscales in the study population

Items of Fatigue Scale	Mean and Std. Deviation
Severity of fatigue in past week	
1-Most fatigue past week	5.40 ± 3.12
2-Least fatigue past week	3.52 ± 2.53
3- Average fatigue past week	4.43 ± 2.54
4- Fatigue now	3.29 ± 3.08
Total	4.16 ± 2.14
Fatigue interfere with activity in the past week	
1- general level of activity	5.23 ± 3.27
2- ability to bath & dress yourself	3.40 ± 3.34
3- normal work activity	4.68 ± 3.14
4- ability to concentrate	3.89 ± 3.36
5- relation with other	3.84 ± 3.47
6- enjoyment of life	4.67 ± 3.46
7- interfered with your mood	5.23 ± 3.19
Total	4.42 ± 2.86
Frequency of fatigue in past week	
1- how many days (past weeks) you felt fatigue	4.30 ± 2.20
2- how much of the day( past week ) you felt fatigue	4.77 ± 3.23
Total	4.54 ± 2.50
Daily pattern of fatigue ( Diurnal)	2.93 ± 1.33

Table 2: Relation of fatigue subscales with socio-demographic data of study Population

Variable	Mean and SD of Fatigue Subscale			
	Severity	Interference	Frequency	Diurnal
<b>Age</b>				
30 – (n= 19)	3.59 ± 2.05	3.51 ± 3.15	3.27 ± 2.53	2.83 ± 1.33
40- (n= 33)	4.85 ± 1.77	5.35 ± 2.35	4.98 ± 2.21	2.90 ± 1.37
50- (n= 31)	3.79 ± 2.41	4.10 ± 3.06	4.50 ± 2.45	2.87 ± 1.33
60- (n= 17)	4.51 ± 1.81	4.20 ± 2.67	5.42 ± 2.39	3.28 ± 1.20
<b>Sig. Test</b>	<b>P=0.06</b>	<b>P=0.28</b>	<b>P= 0.07</b>	<b>P= 0.80</b>
<b>Marital Status</b>				
Married (n= 65)	4.28 ± 2.03	4.14 ± 2.68	4.66 ± 2.42	3.18 ± 1.18
Single (n= 24)	3.19 ± 1.96	4.31 ± 3.13	3.68 ± 2.57	2.16 ± 1.49
Divorced (n= 11)	5.52 ± 2.39	6.28 ± 2.89	5.63 ± 2.45	3.09 ± 1.30
<b>Sig. Test</b>	<b>P= 0.008*</b>	<b>P= 0.07</b>	<b>P= 0.07</b>	<b>P= 0.005*</b>
<b>Financial status</b>				
Poor& Middle (n= 62)	4.45 ± 1.93	4.77 ± 2.79	4.98 ± 2.51	2.91 ± 1.41
Good (n= 34)	3.70 ± 2.24	3.86 ± 2.65	3.76 ± 2.26	2.85 ± 1.25
Very good (n= 4)	2.37 ± 2.55	2.50 ± 4.33	3.37 ± 2.68	3.50 ± 0.57
<b>Sig. Test</b>	<b>P= 0.02*</b>	<b>P= 0.06</b>	<b>P=0.05*</b>	<b>P=0.69</b>
<b>Duration of Disease</b>				
> 1 year (n= 26)	3.37 ± 2.05	3.20 ± 2.69	3.25 ± 2.80	2.54 ± 1.58
1 – > 5 years (n= 12)	4.19 ± 1.86	4.44 ± 2.72	4.71 ± 2.28	2.94 ± 1.26
≤ five years (n= 62)	4.92 ± 2.63	5.67 ± 2.95	5.50 ± 2.21	3.31 ± 1.12
<b>Sig. Test</b>	<b>P=0.04*</b>	<b>P=0.01**</b>	<b>P=0.00**</b>	<b>P=0.14</b>
<b>Hemoglobin Level</b>				
Normal (n= 73)	4.39 ± 2.02	4.57 ± 2.84	4.77 ± 2.38	3.14 ± 1.22
Abnormal (n= 27)	3.54 ± 2.37	4.02 ± 2.95	3.91 ± 2.75	2.37 ± 1.47
<b>Sig. Test</b>	<b>P=0.07</b>	<b>P=0.39</b>	<b>P=0.12</b>	<b>P=0.01**</b>

\* Significant

\*\* Highly Significant

Table 3: Fatigue severity and physical symptoms

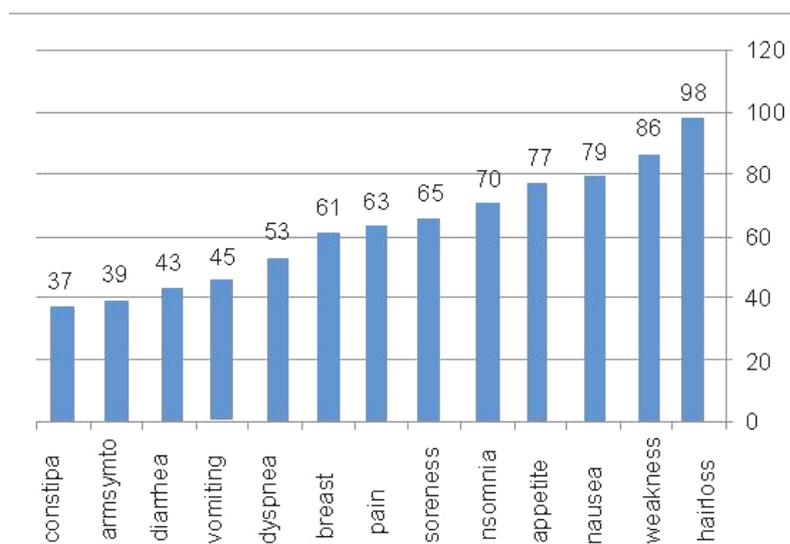
Physical Symptoms	Fatigue Severity		
	Mild 32%	Moderate 36 %	Sever 32%
Pain (n= 63)	15	27	21
Vomiting (n = 45)	16	14	15
Nausea (n= 79)	23	30	26
Arm Symptoms (n= 39)	8	17	14
Weakness (n=86)	23	33	30
Soreness of the mouth (n= 65)	17	29	19
Dyspnia (n=53)	13	20	20
Diarrhea (n=43)	10	18	15

Table 4: Relationships between physical symptoms and fatigue subscales

Physical Symptoms	Subscale of Fatigue Mean± SD			
	Severity	Interference with activity	Frequency	Diurnal
Pain (n= 63)	4.57 ± 2.09 P= 0.01** SE= 0.26	4.95 ± 2.71 P= 0.01** SE= 0.34	5.02 ± 2.35 P= 0.01** SE= 0.29	2.85 ±1.29 P= 0.47 SE= 0.16
Vomiting (n = 45)	4.21 ± 2.24 P= 0.83 SE= 0.33	4.47 ± 3.03 P= 0.86 SE= 0.45	4.26 ± 2.42 P= 0.33 SE= 0.36	2.82 ±1.38 P= 0.46 SE= 0.20
Nausea (n= 79)	4.36 ± 2.06 P= 0.06 SE= 0.23	4.55 ± 2.86 P= 0.36 SE= 0.32	4.74 ± 2.44 P= 0.10 SE= 0.27	2.94 ±1.28 P= 0.78 SE= 0.14
Arm Symptoms (n= 39)	4.71 ± 2.26 P= 0.03 * SE= 0.36	5.19 ± 2.52 P= 0.03 * SE= 0.40	5.52 ± 2.17 P= 0.001** SE= 0.34	3.00 ± 1.12 P= 0.67 SE= 0.17
Weakness (n=86)	4.60 ± 1.88 P=0.00 SE= 0.202	4.99 ± 2.62 P= 0.00 SE= 0.283	5.06 ± 2.22 P= 0.00 SE= 0.239	2.96 ± 1.24 P= 0.517 SE= 0.133
Soreness of the mouth(n= 65)	4.36 ± 2.15 P= 0.19 SE= 0.26	4.67 ± 2.67 P= 0.22 SE= 0.33	4.93 ± 2.45 P=0.02* SE= 0.305	2.96 ±1.29 P=0.69 SE= 0.16
Dyspnia (n=53)	4.47 ± 2.09 P= 0.11 SE= 0.287	5.10 ± 2.73 P=0.01* SE= 0.376	5.02 ± 2.23 P=0.03* SE= 0.307	3 ± 1.17 P= 0.58 SE= 0.16
Diarrhea (n=43)	4.16 ± 2.19 P= 0.97 SE= 0.33	4.631 ± 3.01 P= 0.52 SE= 0.45	4.616 ± 2.29 P=0.78 SE= 0.35	3.348± 1.08 P= 0.00* SE= 0.16

\* Significant

\*\* Highly Significant

**Fig. 1: Prevalence of main physical symptoms experienced by study population**

(98% and 86%) respectively. and more than half of them suffered from dyspnea, breast symptoms and soreness of the mouth. While, the lowest percentage (37%) patients complaining from constipation.

## Discussion

The current study on patients receiving chemotherapy in our patient department has verified that fatigue is a common complaint in patients with breast cancer. Fatigue is a common consequence of cancer chemotherapy and it is a symptom with several etiological factors related to the disease and its treatment. Furthermore, fatigue patients are less physically active, less able to participate in enjoyable activities with increased weakness, in addition, fatigue may be indicators of tiredness, such as reduced energy expenditure, sleep disturbance, decreased endurance, and weakness [15, 27]. The study sample 100 patients were experienced fatigue according to (FSI) table (1), the highest mean score was for frequency of fatigue (4.54 + 2.50) which indicated that the patients were complaining from fatigue during the last week and followed by the subscale fatigue interference with daily activity (4.42 + 2.86). This finding is in agreement with many previous studies [13, 27] they stated that women who received chemotherapy reported that fatigue has a major effect on their quality of life. The present study showed that a significant relationship between subjects demographic characteristics (such as: marital status and financial difficulties) and fatigue, this is in consistent with earlier studies [13, 28]. Anemia is the most powerful physical contributor to fatigue. The relationship between anemia and fatigue is so important that the majority of signs and symptoms of anemia are related to fatigue in breast cancer patients under chemotherapy treatment. [27, 29]

Hemorrhage, haemolysis, and nutritional deficiencies, as well as the increased production of cytokines which caused a reduction in production of erythropoietin, and hence contributing to impaired iron use, are all potential causes of cancer-associated anemia. Moreover, adjuvant therapy can be important factors in causing anemia [29,30,31]. The present study is in agreement with the above mentioned studies, there was a statistically association between fatigue and anemia. In addition, various study found that fatigue was the most frequent manifestation of anemia in patients with breast cancer receiving chemotherapy [32,33,34]. Fatigue like pain is a subjective symptom and hence varies from patient to another patient, and from time to time lead to physical restriction. In the current study fatigue severity was statistically associated with certain physical symptoms such as: pain ( $P= 0.04$ ), soreness of the mouth ( $P= 0.04$ ) and also general weakness ( $p = 0.02$ ) the explanation could be that most patients with cancer experience pain and this could lead to many other physical complicated symptoms which may cause fatigue. Mutilation caused by treatments leads to bad reaction about losing hair, when patients looking at the mirror, they think that they are ugly, undesirable, and the only thing

they can see is the hair loss. Sometime this can cause greater pain than the fact that they are suffering from cancer [13, 35].

Fatigue prevented patients from leading a normal life and their conducting their daily routine. In the present study there were statistically significant relations between pain, nausea, arm symptoms, general weakness, diarrhea, dyspnea and fatigue. This finding is consistent with another study [36]. Hartving et al. [20] conducted study on 147 cancer patients receiving cytotoxic drugs they used the FSI scale for assessment of fatigue, they found that there was a statistically correlation between pain, nausea and fatigue. they concluded that that fatigue is a common side effects, and affects quality of life negatively, in addition Safae et al. [13] declared that a significant correlation between diarrhea and fatigue in a cross- section study on 119 random sample of Iranian patients with breast cancer. While, Kim et al. [37] stated that arm symptoms could be a long-term effect of adjuvant therapy and have been previously reported as a significant factors related to fatigue.

## Conclusion and Recommendation

Most patients with breast cancer suffered from fatigue, which was aggravated by chemotherapy treatment. The present study supported previous findings that fatigue in breast cancer patients is a serious problem. The prevalence of fatigue in the current study highlights the importance of educating nurses and health personnel about assessment and management of fatigue. Nurses and clinicians, who care for breast cancer patients experiencing fatigue, must be aware of patients' socioeconomic status. Implications for further research study include conducting prospective studies design with large number of patients to investigate incidence, pattern and severity of symptoms and also examine the functional status impairment in those patients under chemotherapy treatment. This might give better insight into the magnitude and management of fatigue in patients with breast cancer receiving chemotherapy treatment.

Limitations: the study sample included only patients from outpatients department with breast cancer receiving chemotherapy. In addition, the study did not include a control group and this therefore will be difficult to conclude whether breast cancer patients were complaining from fatigue as compared to other patients suffered from other types of cancer. Also the present study didn't assess the psychological and social factors which might have strong effects on patients [12, 38].

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