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# An Original Research about: The Associations of Depression and Fatigue with Quality of Life among Palestinian Patients with Cancer

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## Abstract

**Purpose:** To explore the relationships between depression, fatigue and QoL among patients diagnosed with cancer in the West Bank.

**Method:** This was a descriptive, correlational study. 172 patients with lung, breast, colon, prostate and stomach cancer participated in the study. Depression, fatigue and quality of life were assessed for patients who undergoing chemotherapy. All instruments were reliable and valid.

**Results:** The mean score for depression was 22 (SD=8). This indicated that many patients in this study experienced depression. The participants had moderate fatigue 51 (SD=39). The same results were found in quality of life dimensions, as the mean score for functional scales and global health status ranged from 50 to 73 and for symptom scales ranged from 27 to 45. Regarding the correlation, the results showed that there were significant correlation between depression and fatigue and all quality of life dimensions (all  $p < 0.05$ ).

**Conclusion:** Depression and fatigue were significantly correlated with QoL. The impact of depression should be taken into consideration by health care workers when designing or planning interventions to improve QoL for patients with cancer through accurate and early assessment. The moderate fatigue that patients with cancer experienced by the disease or by the treatment should also be taken into account. Each one of the key variables negatively affects QoL in separate. The occurrence of them simultaneously may increase the worse effect on QoL for patients with cancer. Based on that, depression and fatigue should be assessed for each patient with cancer.

**Keywords:** Depression; Fatigue; Cancer; Palestine; Quality of life

Cancer is still a progressive and intractable disease as 50% of patients with cancer die of their disease [2]. Since cancer causes severe health problems due to the tumor burden or to the treatment regimens [3], the treatment modalities for them not only aim to curability from the disease or increase longevity but also relieving cancer-related symptoms. Experiencing such symptoms during daily life make a big burden on patients with cancer and may affect their physical, mental and social wellbeing [3]. The number of people living with cancer after diagnosis is nearly 14.5 million in 2014 in the United States and is expected to rise [4]. All these factors highlighted the importance of assessing quality of life (QoL) among patients with cancer.

Quality of life is the person's perception and experience of health-related aspects of life based on assessment of the physiological, psychological, and situational factors [5]. It is a multidimensional concept which based on the subjective experience of the patients [6]. Quality of life studies have shown evidence that is important for patients with cancer and their management, and for outcomes of cancer-related interventions [7]. The survival patients with cancer may experience many symptoms that affect their sense of well-being and QoL. A study was conducted by Saadatmand et al. [8] found that most patients with cancer had a relatively moderate level of overall QoL. Thweib [9] conducted a study about patients with cancer to highlight the concept of QoL through assessing the influences of cancer and chemotherapy on QoL. The author found that QoL were low on all aspects, most of the QoL dimensions were less than the half of full function, and more intense symptoms and negative effects were found [9]. In another study, Dreidei and Mansour [10] found that QoL was moderate among patients with cancer and majority of patients had better cognitive functioning than other aspects of their QoL and most of them suffer from appetite loss.

## Background

Patients with cancer are subject to a number of health problems and appear as signs and symptoms that are physical and psychological of nature [11]. The literature showed that low physical health status, and high levels of depression were common among patients with cancer [11-14]. The significance of these problems is mainly related to its profound impact on patient's physical, physiological, emotional, social and spiritual

## Introduction

Cancer is an emerging disease and is a major cause of death worldwide [1]. It accounts for 8.2 million deaths in 2012 [1].

well-being that consequently, may deteriorate patients' QoL [15,16]. Moreover, the literature showed that fatigue and depression had an effect on patients' treatment outcomes [11,13,17,18].

Depression emerges as a reaction to the cancer diagnosis but it lasts for long time due to treatment and illness signs and symptoms. Massie [19] found that depression might have prevalence as high as 38% among patients with cancer. Depression is also found to be one of the most difficult psychiatric problems to diagnose in patients with cancer [19]. Vahdaninia et al. [20] conducted a longitudinal study to investigate psychological distress in patients with breast cancer following completion of breast cancer treatments. The authors found that levels of depression decreased over time (in the first three measurements) but a significant number of women (22.2%) had elevated depression at the 18-months follow up (forth measurement). This result suggested that all women with cancer should be screened for depression especially who are with other symptoms as pain or fatigue. Depression has been under-diagnosed, underestimated and under-treated because many healthcare workers worked under the assumption that patients with cancer should be depressed and unfortunately this notion pervades the clinical situations today [21].

Fatigue and depression are highly prevalent among patients with cancer. They have a detrimental effect on patients' QoL [22]. About 66% of patients with breast cancer suffer from fatigue after diagnosis and extends beyond treatment end [23]. Fatigue is a multidimensional symptom that affects various aspects of life for patients with cancer [24]. A study found a moderate effect of fatigue among patients with breast cancer and significant correlations among fatigue, depression and body image [25]. Fatigue is increased among patients with cancer as the treatment begins. A study compared the level of fatigue between pretreatment and during treatment for patients with breast cancer. They found that those who experience more fatigue at the beginning of treatment tend to experience worse symptoms later. This highlights the importance of assessing fatigue among patients with cancer.

World Health Organization [26] stated that cancer incidence will increase in the coming 15 years in the Eastern Mediterranean region. Regarding Palestine, cancer is the second leading cause of death in Palestine [27]. In 2011, a total of 1350 cancer cases were reported including 631 males (46.7%) and 719 (53.3%) females [27].

The issue of having patients receive adequate health care is a milestone for health care professionals and agencies. However, the literature showed that diagnostic and treatment approaches for patients with cancer are overwhelming them and causing further physical and psychological deteriorations [28]. There is a need to explore factors that connect and influence the psychological and physical health status with patients' QoL. This study came to address these issues that have been scarcely addressed in the Arab region and in Palestine in particular. The study will expand our knowledge about the interrelationship among these factors within the Palestinian context. Therefore, this study aimed to explore the

relationships between depression, fatigue and QoL among patients diagnosed with cancer in the West Bank.

## Methodology

### Design

The study utilized a cross-sectional, descriptive-correlational design using survey method for obtaining data about fatigue, depression and quality of life from patients diagnosed with lung, breast, colon, stomach and prostate cancer in the West Bank, Palestine. Data in this study was elicited from the participants using self-reported questionnaires format. The study utilized well-established, reliable and valid measures of these constructs.

### Population and sample

All Palestinian patients diagnosed with cancer represented the potential population of this study. Nonprobability, convenience sampling technique was used to recruit the subjects in this study. Potential participants were all patients who undergoing chemotherapy either in the day care or admitted in the oncology ward. The inclusion criteria were: 1) patients with confirmed medical diagnosis of lung, breast, stomach, colon and prostate cancer, 2) were aged 18 years or older, and 3) were able to read and write Arabic. The patients were excluded if they 1) have comorbidities diseases (i.e., chronic renal failure, heart failure, mental or cognitive disorder), 2) have a history of a second primary tumor, and 3) are receiving chronic antidepressant therapy as it could affect the perceived level of depression among the participants.

### Setting

The two healthcare centers, in the West Bank, that provide care to patients with cancer were targeted to recruit the sample. The first center is in the south of the West bank and the second center is in the north of the West Bank. Both centers have no radiotherapy treatment modality. The two centers just provide chemotherapy and surgeries as modalities for the management of patients with cancer. The two centers are public ones and the ministry of health is the responsible agency.

### Instruments

First, the sociodemographic questionnaire was developed by the researcher to acquire information about the participants' characteristics. This questionnaire assessed information about age, marital status, gender, educational background, types of cancer and duration of diagnosis.

**The major variables were measured by the following instruments:**

#### **The center for epidemiological studies depression scale**

The Center for Epidemiological Studies Depression Scale (CES-D) was developed to assess depression [29]. Since its publication, the scale has been used most frequently to

measure depression symptoms among patients with non-cancer and cancer [30-32]. It is a 20-item self-report scale. Participants were asked to rate each item on a 4-point Likert scale, seldom or never (0), sometimes or a little (1), regularly (2) to the most of the times or always (3). Four items (4, 8, 12 and 16) are worded in a positive direction to control for response bias. The total score is calculated by reversing scores of the positively worded items, then summing all of the scores. The range of CES-D score is 0 to 60, with higher scores indicating more severe depression [33]. A score of 15 or less indicates that there is no depression, 16 to 21 indicate that mild to moderate depression, and scores of greater than 22 indicate possibility of major depression. The scale has high psychometric properties [34].

#### **The european organization for research and treatment of cancer quality of life questionnaire-C30 (EORTC-C30)**

The (EORTC-C30) was established to measure QoL for patients with cancer [35]. The EORTC-C30 version-3 scale was used to measure QoL in the current study. The EORTC-C30, a 30-item questionnaire has three dimensions; functional scales, global health status and symptom scales. Patients were asked to respond to each item on a Likert type scale ranging from 1 to 4 except the last two items in the global health status which ranges from 1 to 7. All scores were ranged from 0 to 100. A high score of the functional subscale and global health status represent high levels of the functioning and high QoL, but a high score of symptom scales represent high levels of symptomatology. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-C30 is a highly validated and reliable measure [36]. In the current study, the reliability was assessed by Cronbach's alpha coefficient, in which the values were all > 0.70, with the exception of cognitive function and pain ( $\alpha = 0.67$  and  $0.51$  respectively).

#### **Nottingham health profile (NHP)**

The Nottingham Health Profile is a survey used to measure perceived physical, emotional, and social aspects of health [37]. Part I of the survey measures six dimensions of health including: social isolation, emotional reactions, energy level, physical mobility, pain and sleep. Between 3 and 8 items are associated with each dimension [37]. For the purpose of the current study, energy dimension was used to measure fatigue. Scores range from 0 to 100. A higher score indicates more fatigue [38]. The NHP has high validity and reliability [39].

#### **Data collection procedure**

After ethical approval was obtained from the targeted institutions. Participants were recruited and informed about the study and that their participation is voluntary and that they have the right to withdraw at any time during the study. They also informed that their responses will be securely confidential and anonymous. The participants were asked to read the cover letter. The cover letter included information about the purpose of the study, its significance, and all ethical related information. Data collection started at the beginning of June 2013 and continued until the end of September 2013 to

reach the targeted sample size which was 150 participants. However, the actual sample was 172 participants. The targeted health centers were contacted to ask for their permission to collect data from patients in their units. The letter to the selected healthcare centers included a request to assign a private room where patients can be contacted to fill out the questionnaires at their convenience. The eligibility criteria were checked by reviewing the patients' charts after taking their permission. A package of four self-report questionnaires was distributed to the participants who expressed their interest in the participation in the study. The participants were instructed that their completion of the questionnaire will be considered as a written consent for their participation. Furthermore, the data was kept in a closed cabinet at the Faculty of Nursing- Birzeit University for which no one but the researcher has access to. Data collection was conducted from the patient during their visits to the health center and the time for filling the questionnaires took about 12 minutes. The whole package was presented in Arabic language.

#### **Data analysis**

Data was analyzed using Statistical Package for Social Sciences (SPSS) software program version 19, data was screened for missing data. Univariate statistics were used to describe the mean, standard deviation, frequency and percentage of the sample regarding demographic variables, depression, fatigue, and QoL. Assessing the variables for normality and outliers were done to detect the assumptions of inferential tests. Pearson correlation Coefficient (Pearson  $r$ ) was used to test the correlation between selected factors and indicators and to determine associations between demographics and key study variables. The t-test for two-independent samples and ANOVA were used to test for difference in depression, fatigue and QoL among the patients. Also t-test for two-independent samples was used to examine the difference between patients in relation to selected demographic and personal factors.

#### **Results**

As shown in **Table 1**. A total of 172 patients participated in this study. The average age for the sample was 53 years old. Females represented 59% ( $n=102$ ) of the sample compared with males 41% ( $n=70$ ), 70% were married, and 68% were unemployed. In relation to the level of education, most of the participants 74% ( $n=127$ ) had high school education or less. The highest type of cancer was the breast cancer 25% ( $n=43$ ). The median for the period of diagnosis was 6 months (**Table 1**).

The mean score for depression among patients with cancer was 22 ( $SD=8$ ). The score above 15 is considered moderate depression and above 21 is considered major depression [29]. This indicated that majority of the participants had experienced depression (**Table 2**). About a quarter of patients had a score of 16 and less, 75% ( $n=129$ ) with score of 27 and less (**Table 3**). The results showed that the mean score for fatigue was 51 ( $SD=39$ ), 70% of the sample scored less than 70

(Table 3). These results indicated that high percentage of participants experienced low energy level (Table 4).

**Table 1** Demographic characteristics of the sample (N=172).

Variable	n	%	M	SD	P50	Min	Max
Age (years)	--	--	53.5	15.3	55	20	83
Gender							
Male	70	40.7	--	--	--	--	--
Female	102	59.3					
Marital status							
Single	24	14	--	--	--	--	--
Married	121	70.3					
Divorced	10	5.8					
Widow	17	9.9					
Level of Education							
High school or less	127	73.8	--	--	--	--	--
Diploma	18	10.5					
Baccalaureate	24	14					
Graduate	3	1.7					
Working Status							
Unemployed	117	68	--	--	--	--	--
Full time job	27	15.7					
Part-time job	12	7					
Retired	16	9.3					
Type of Cancer							
Lung	33	19.2					
Breast	43	25	--	--	--	--	--
Colon	37	21.5					
Liver	30	17.4					
Stomach	29	16.9					
Duration of diagnosis (months)	--	--	9	8.8	6	1	36
Hospitals							
North	79	46					
South	93	54					

**Table 2** Descriptive characteristics of the depression, fatigue and quality of life functional scales, global health status and symptom scales (N=172).

Variable	M	SD	Range	P25	P75
Depression	21.7	7.9	44	16	27
Fatigue	50.9	39.3	100	11.2	69.8
Functional Scales					

Physical functioning	59.7	30.9	100	33.3	86.7
Role functioning	65.3	31.5	100	50	100
Emotional functioning	66.8	27.3	100	50	91.7
Cognitive functioning	73.1	28.9	100	50	100
Social functioning	65.8	31.2	100	33.3	100
Global health status	52.1	26.8	100	33.3	66.7
Symptom Scales					
Fatigue	44.6	29.1	100	22.2	66.7
Nausea and vomiting	36.8	33.2	100	35.4	56.2
Pain	41.9	27.2	100	16.7	66.7
Dyspnea	34.9	32.4	100	15.5	64.3
Insomnia	46.7	36	100	33	67
Appetite loss	46.3	35.2	100	33.3	66.7
Constipation	31.4	37.2	100	19.7	67
Diarrhea	27.3	34	100	0	33.3
Financial difficulties	37	34.1	100	0	66.7

**Table 3** Descriptive characteristics of depression level (N=172).

Depression Level	n	%
Not depressed	42	24.4
Mild to moderate depression	44	25.6
Major depression	86	50

**Table 4** Descriptive characteristics of fatigue items for participants who responded yes to each question (N=172).

Items	Frequency	Percentage
1. I am tired all the time.	62	33.7
2. Everything is an effort.	118	64.1
3. I soon run out of energy.	74	40.2

Regarding the quality of life, the highest functioning was for cognitive functioning (m=73, SD=29) and the lowest one was social functioning (m=66, SD=31). Global health status was moderate (m=52, SD=27). In relation to the symptom scales, the highest symptom experienced by patients was insomnia (m=47, SD=36). These results showed that majority of the patients had moderate physical functioning and global health status and experienced many symptoms that affect their perceived QoL.

## Inferential analysis

In relation to gender differences, t-test was used to assess the differences between male and female regarding depression, energy and QoL. The analysis showed that there were significant differences between male and female

participants regarding depression (t=-2.51, p=0.01), period of diagnosis (t=2.17, p=0.03), cognitive functioning (t=3.16, p<0.01), social functioning (t=2.50, p=0.01), and financial difficulties (t=-2.50, p=0.01). The mean scores were higher (less functioning and more difficulties) among female participants. Regarding the two settings, there were no statistical differences among the variables (all p>0.05). One-way ANOVA was conducted to assess the differences in types of cancer across the study variables. It was found that there were significant differences in types of cancer across nausea and vomiting (f=2.95, p=0.02), dyspnea (f=5.06, p<0.01) and loss of appetite (f=5.21, p<0.01). After post hoc analysis was done, it was found that most of these differences were attributed to lung cancer. In relation to the job, there were significant differences between who work full time job and who does not work across physical functioning (f=2.97, p=0.03) and cognitive functioning (f=2.79, p=0.04) with better score for full time job group. A significant difference is also found across groups of education, the less educated the participant the more fatigue they perceive (f=3.75, p=0.003). Regarding types of cancer, it was found that there were significant differences among types of cancer in nausea and vomiting (f=2.95, p=0.022), dyspnea (f=5.06, p<0.01), and loss of appetite (f=5.21, p<0.01). Post hoc analysis showed that there were significant differences in nausea and vomiting between lung and stomach with the other types of cancer. Nausea and vomiting was experienced more in patients with lung and stomach cancer. The differences in dyspnea and loss of appetite were attributed by lung cancer compared with the other types of cancer.

A Bivariate Pearson correlation analysis was done to examine the associations among depression, age, period of diagnosis, fatigue and QoL subscales. The results showed that

there was a significant positive correlation between fatigue and depression ( $r=0.448$ ,  $p<0.01$ ). This indicated that an increase in depression is associated with high fatigue. Age had significant negative associations with physical, role and cognitive functioning of QoL. Age has also significant positive correlation with pain ( $r=0.16$ ,  $p=0.04$ ) and dyspnea ( $r=0.166$ ,  $p=0.029$ ) in symptoms scales of QoL (**Table 5**).

**Table 5** Intercorrelations among age, depression, fatigue, period of diagnosis and quality of life subscales (N=172).

Variable	Age	Period of Diagnosis	Fatigue	Depression
Functional scales				
PF	-0.38**	-0.21**	-0.53**	-0.47**
RF	-0.23**	-0.1	-0.36**	-0.37**
EF	-0.11	-0.20**	-0.50**	-0.61**
CF	-0.22**	-0.13	-0.39**	-0.45**
SF	-0.06	-0.05	-0.35**	-0.47**
GHS	-0.11	-0.17*	-0.39**	-0.46**
Symptom scales				
FA	0.15	0.23**	0.59**	0.49**
NV	-0.02	0.19*	0.44**	0.35**
PA	0.16*	0.18*	0.46**	0.49**
DY	0.17*	0.18*	0.36**	0.33**
SL	0.14	0.15*	0.43**	0.45**
AP	0.13	0.14	0.41**	0.36**
CO	0.13	-0.01	0.30**	0.20**
DI	0.02	0.09	0.17*	0.20**
FI	0.07	0.15	0.29**	0.34**

\*\*Correlation is significant at the 0.01 level (2-tailed).  
\*Correlation is significant at the 0.05 level (2-tailed).

PF: Physical Functioning; RF: Role Functioning; EF: Emotional Functioning; CF: Cognitive Functioning; SF: Social Functioning; GHS: Global Health Status; FA: Fatigue; NV: Nausea and Vomiting; PA: Pain; DY: Dyspnea; SL: Insomnia; AP: Appetite Loss; CO: Constipation; DI: Diarrhea; FI: Financial Difficulties

This indicated that increasing in age is associated with worsening pain and dyspnea and decrease in physical, role and cognitive functioning. Regarding period of diagnosis, it was found that there were significant negative correlations with physical, emotional and global health status and positive correlations with fatigue, nausea and vomiting, pain, dyspnea and insomnia. This indicated that an increase in period of diagnosis is associated with worsening symptom scales and a decrease in functional scales of QoL. In relation to the fatigue, it was found that fatigue has significant negative associations with all functional scales and global health status and positive associations with all symptom scales of QoL. Depression had also significant negative relationships with all functional scales and global health status and positive correlations with

symptoms scales of QoL (**Table 5**). The more the patient depressed the high fatigue and the more he experienced low functional scales and worse symptom scales of QoL.

## Discussion

Cancer is one of the major causes of death among Palestinian population [27]. Literature shows that cancer is a progressive disease that causes severe health problems due to the disease itself or the treatment modalities, thus substantially affects the QoL for patients. As cancer is intractable disease, QoL becomes a very important outcome for patients with cancer.

The results of this study indicate that a significant proportion of Palestinian patients with cancer have moderate to severe depression and experience moderate fatigue. These factors were significantly correlated with QoL dimensions. The Palestinian patients with cancer tend to have better cognitive functioning than physical functioning. In relation to the symptom scales, the worst symptom was appetite loss (M=47) and the best symptom was diarrhea (M=26) and constipation (M=31). This means that more patients complain of appetite loss in comparison with other symptoms. The results also showed that about half of the sample had severe depressive symptoms. One possible explanation is that cancer is negatively perceived by patients and patients account heavily on the consequences of treatments such as sessions of chemotherapy and biophysical changes in their body and appearance [40]. The reported level of depression also could be due to the overestimation by self-reports from patients with cancer or due to the Palestinian cultural background. The results of this study agree with previous results in that depression is not uncommon among patients with cancer. According to Brown and associates [41] 44% of their sample of patients with cancer reported severe level of depression, while Pud [40] found that depression incidence among Israeli patients with cancer was 38% [40]. Previous studies have also found that the majority of their sample of patients with cancer had moderate to severe depression that corresponds with the findings in this study [19,42]. Fatigue is also experienced by many patients with cancer. It is significantly correlated with depression. This indicated that fatigue appears in conjunction with depression. These results are consistent with previous studies [43-45]. Sawada et al. [46] found that many patients experienced fatigue and depression and their levels increased after beginning of the treatment.

This study also found differences between males and females in their reports of depression that also corresponds with previous studies [3,47]. Kroenke et al. found significant difference between male and female regarding the depression in patients with cancer with more symptoms among female patients. This may be attributed to the fact that females experienced the signs and symptoms of the disease in a worse way than male besides that they are emotionally sensitive more than male [3]. However, Yamagishi et al. [48] had found that there were no significant differences between males and females regarding depression and QoL. They have also reported that there were no differences between patients'

reports of depression and quality of life in regards to type of cancer and demographic characteristics.

The results of this study show that the sample had a relatively moderate level of overall QoL. This result may be explained by the signs and symptoms that are experienced by the patients or due to the treatment modalities. These results were consistent with other studies [8,49]. However, in another study, QoL was found to be low on all aspects; most of the dimensions of QoL were less than half of full function, and more severe symptoms were found [9]. One possible explanation for that was due to the sample characteristics (i.e., the differences in duration of diagnosis). Despite the differences in the types of cancer, many studies had found almost the same results regarding the symptoms scales [50,51].

Depression was found to be associated with all domains of QoL in patients with cancer. In fact, diagnosis of cancer and the treatment of cancer with its collateral side effects produce psychological disturbances that are related and affected QoL. These results were consistent with other studies [41,52]. Cataldo et al. [53] indicated that high level of depression was associated with low levels of QoL. Alacacioglu et al. [54] stated that the functional scales and global health status of QoL for depressive patients were significantly lower than that of non-depressive patients with cancer.

## Conclusion

Depression and fatigue were significantly correlated with QoL. The high prevalence of depression is still thought to be normal among patients with cancer. This belief that exists in the clinical situations should be changed. Whatever the origin of the cognitive, emotional and social distress, the impact of depression should be taken into consideration by health care workers when designing or planning interventions to improve QoL for patients with cancer through accurate and early assessment. The moderate fatigue that patients with cancer experienced by the disease or by the treatment should also be taken into account. Each one of the key variables negatively affects QoL in separate. The occurrence of them simultaneously may increase the worse effect on QoL for patients with cancer. Based on that, assessing these factors and early intervention may lead to alleviation of these symptoms which enhance QoL for these patients.

The treatment for cancer are growing and improving. This led to increase in the survival of patients with cancer. Quality of life for those patients should be the outcome measure to assess the disease progression and treatment efficacy. The QoL for patients is affected by their perception. Patients with cancer are interested in their wellbeing and QoL. They have their own beliefs, practices, and thoughts toward their current status. The impact of depression affected their psychological status and thus their QoL will be compromised. The same goes for fatigue, as the physical abilities deteriorated with time, the patients with cancer became more and more dependent on their primary caregivers and more symptoms appeared as depression and this will further distort their QoL.

This study has different limitations; 1) the convenience sampling method that was used makes the generalizability of the results of the study to be taken with precautions. It may make the target sample biased and not representative, 2) the inclusion of different types of cancer, as each type may have its own factors, mechanisms and signs and symptoms, and this may affect the QoL in different ways. For example, lung cancer may affect dyspnea more than stomach cancer. This may affect QoL perception by patients with those two types of cancer, 3) cross-sectional design is also a potential limitation as this study may give more extensive and significant information if longitudinal design is used and 4) this study depended upon using self-report scale by participants to rate their perceptions regarding physical, psychological factors and QoL.

## Relevance for clinical practice

The curriculum in the undergraduate and graduate level of nursing education should include the evidence-based regarding caring for patients with cancer. In addition, ongoing educational programs for clinical practice should consider guidelines for the importance of assessment and treatment of depression, fatigue and their impact on QoL for patients with cancer. Nursing should realize the importance of treating and caring for patients with fatigue and depression. Furthermore, it is important for nursing to help the patients with cancer to reach the lowest level of fatigue which may lead to optimum QoL.

Education of patients and their families regarding depression and fatigue and their effect on QoL could help them to manage their symptoms more effectively and express their feelings and perception in clearer way which may enhance their QoL. They should be encouraged to report their depression and their perceived level of fatigue. The patients with cancer also should be educated about depression and be aware that they do not have to live with depression, because many health care workers and patients still believe that there is no treatment for it.

### Conflict of interest

There is no conflict of interest.

### Authorship statement

All authors are in agreement with the manuscript.

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