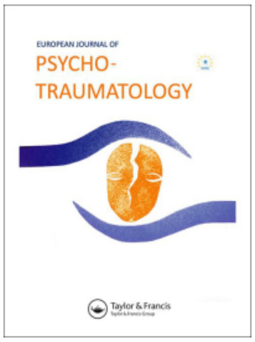

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# Quality of life and post-traumatic stress disorder among adult females with cancer in Palestine: a cross-sectional study

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BASIC RESEARCH ARTICLE

# Quality of life and post-traumatic stress disorder among adult females with cancer in Palestine: a cross-sectional study

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## ABSTRACT

**Background**: Little research has been conducted on the quality of life (QoL), functional status, and traumatic symptoms related to the diagnosis and treatment of cancer in the Arab region, particularly in Palestine, where the psychological problems in patients with cancer are often neglected.

**Objective**: The aim of the study was to assess QoL and post-traumatic stress disorder (PTSD) symptoms among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem.

**Method**: Participants were recruited from 4 April 2015 to the end of July 2015. The sample included 253 female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem. Data were collected using self-reported questionnaires, including a socio-demographic data sheet, the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core 30, and the post-traumatic stress disorder checklist for PTSD symptoms.

**Results**: The current study showed poor global QoL (57.4%) and poor physical function (48.5%) for female patients with cancer. Insomnia, fatigue, and loss of appetite were the most troublesome symptoms that the participants complained about. The prevalence of PTSD symptoms was 3%. Regarding PTSD symptom severity, 2% reported severe symptoms, 23.3% reported moderate symptoms, and (68.8%) reported mild symptoms, based on a 1991 classification of PTSD symptom severity scores. Finally, Pearson's test revealed a strong, statistically significant, inverse relationship between QoL domains and PTSD.

**Conclusion**: The study found that the overall QoL of female patients with cancer was low and strongly associated with PTSD symptoms, suggesting that early detection and treatment of these symptoms is critical.

## Calidad de vida y trastorno de estrés postraumático en mujeres adultas con cáncer en Palestina. Un estudio transversal

**Antecedentes**: Se han realizado pocas investigaciones sobre la calidad de vida (CdV), el estado funcional, y los síntomas traumáticos relacionados con el diagnóstico y el tratamiento del cáncer en la región árabe, en particular en Palestina, donde los problemas psicológicos de los pacientes con cáncer a menudo se descuidan.

**Objetivos**: El objetivo del estudio fue evaluar los síntomas de CdV y trastorno de estrés postraumático (TEPT) entre las pacientes adultas con cáncer que asisten al Hospital Gubernamental de Beit-Jala en Belén.

**Método**: Los participantes fueron reclutados desde el 4 de abril de 2015 hasta finales de julio de 2015. La muestra incluyó 253 pacientes con cáncer que asistían al Hospital Gubernamental de Beit-Jala en Belén. Los datos se recopilaron usando cuestionarios autoinformados, incluyendo la hoja de datos sociodemográficos, el Cuestionario de Calidad de Vida Core 30 (QLQC30 en su sigla en inglés) de la Organización Europea para la Investigación y el Tratamiento del Cáncer (EORTC en su sigla en inglés) y la lista de verificación del trastorno de estrés postraumático (PCL-S en su sigla en inglés) para los síntomas de TEPT.

**Resultados**: El estudio actual mostró una mala calidad de vida global (57,4%) y una función física deficiente (48,5%) para las pacientes con cáncer. El insomnio, la fatiga, y la pérdida de apetito fueron los síntomas más molestos de los que se quejaron las participantes. La prevalencia de los síntomas de TEPT fue del 3%. Para la gravedad de los síntomas de TEPT, (2%) informó síntomas graves, (23,3%) informó síntomas moderados y (68,8%) informó síntomas leves según la clasificación de las puntuaciones de la gravedad de los síntomas del TEPT de Weathers et al. (1991). Finalmente, la prueba de Pearson reveló una fuerte relación inversa y estadísticamente significativa entre los dominios de la calidad de vida y TEPT.

**Conclusión**: El estudio encontró que la calidad de vida general de las pacientes con cáncer era baja y está fuertemente asociada con síntomas de TEPT, lo que sugiere que la detección temprana y el tratamiento de estos síntomas es fundamental.

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**PALABRAS CLAVE**
calidad de vida; trastorno de estrés postraumático; pacientes oncológicos; cáncer de mama

**关键词**
生活质量; 创伤后应激障碍; 癌症患者; 乳腺癌

**HIGHLIGHTS**

- Post-traumatic stress disorder is being increasingly diagnosed among patients with cancer, in addition to low quality of life.
- The literature reveals a lack of studies in Palestine assessing these problems in female patients with cancer.
- A cross-sectional study including 253 patients with cancer using three self-reported questionnaires was conducted.
- Job loss circumstances and coping strategies (but not socio-demographic and work variables) were associated with class membership.

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## 巴勒斯坦成年女性癌症患者的生活质量和创伤后应激障碍:横断面研究

**背景**: 关于阿拉伯地区, 有关癌症诊断和治疗的生活质量 (QoL), 功能状态和创伤症状的研究很少, 特别是在巴勒斯坦, 癌症患者的心理问题常被忽略。
**目的**: 本研究旨在评估在伯利恒贝特贾拉政府医院就诊的成年女性癌症患者的 QOL 和 PTSD 症状。
**方法**: 从 2015 年 4 月 4 日至 2015 年 7 月底招募参与者。样本包括 253 名在伯利恒贝特贾拉政府医院就诊的女性癌症患者。数据由自我报告问卷收集, 包括社会人口学数据表, 欧洲癌症研究和治疗组织 (EORTC), 生活质量核心问卷 (QLQC30) 和创伤后应激障碍后检查表 (PCL-S) 症状。
**结果**: 目前研究表明, 女性癌症患者的整体生活质量较差 (57.4%), 身体功能较差 (48.5%) 。失眠, 疲劳和食欲不振是参与者抱怨最麻烦的症状。PTSD 症状的患病率为3%。对于PTSD 症状严重程度, 基于 Weathers (1991) 等, (2%) 报告为严重症状, (23.3%) 报告为中度症状, (68.8%) 报告为轻度症状。PTSD 症状严重程度评分的分类。最终, 皮尔逊 (Pearson) 检验揭示了生活质量与 PTSD 之间存在统计学上强显著的反比关系。
**结论**: 研究发现, 女性癌症患者的整体生活质量较低, 并且与 PTSD 症状密切相关, 这表明早期检测和治疗这些症状至关重要。

## 1. Introduction

Cancer is among the leading causes of morbidity and mortality worldwide, particularly in women. Of the 18.1 million new cases and 9.1 million cancer-related deaths in 2018, half occurred in females (IARC, 2018). Breast cancer is the most common female cancer worldwide, contributing to more than 25% of the total number of new cases diagnosed in 2018. Moreover, in Arab countries, 50% of cases are younger than 50 years compared to 25% in developed countries. Breast cancer is still associated with stigma and is taboo in most Arab countries (El Saghir et al., 2007), which strongly affects the psychological well-being of Arab women (El Saghir et al., 2007). Breast cancer is also the leading cause of cancer death in women (World Health Organization [WHO], 2018; Palestinian Ministry of Health, 2018). In Palestine, while cancer in general is the second most common cause of death, breast cancer is the most commonly diagnosed cancer in women (14.2% of all cancer cases, with an incidence rate of 13.2% per 100,000 population) (Jubran, Shaar, Hammad, & Jarra, 2019). In 2016, 60% of Palestinian women with breast cancer had died prematurely (WHO, 1997).

Quality of life (QoL) and its associated issues have become a vital area of concern to cancer survivors, their families, and care providers. QoL is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad-ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and relationships to salient features of their environment (Quinn, Gonçalves, Sehovic, Bowman, & Reed, 2015).

Cancer survivors are more likely to have 'worse' or impaired QoL compared with the general population, regardless of other demographic factors (Quinn et al., 2015). A 2008 study showed that patients with breast cancer had low global QoL scores at 18 months post-cancer diagnosis (Montazeri et al., 2008).

Every patient with cancer experiences a range of practical, psychological, and emotional challenges as a result of their diagnosis and treatment-related adverse effects (Adler, 2008). Anxiety and distress may affect a patient's ability to cope with the cancer diagnosis or the treatment (NCI, 2015a). Post-traumatic stress disorder (PTSD) is included in Trauma and Stressor-Related Disorders category of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), with symptoms that occur following exposure to an extreme traumatic stress involving the direct personal experience of an event that involves actual or threatened death, serious injury, unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate.

These symptoms include recurrent, involuntary, and intrusive distressing memories, dreams about and flashbacks to the traumatic event(s); intense or prolonged psychological distress with exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s); persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness; negative alterations in cognitions and mood associated with the traumatic event(s), such as markedly diminished interest or participation in significant activities, feelings of detachment or estrangement from others; and persistent symptoms of increased arousal (American Psychiatric Association [APA], 2013).

Since cancer is an experience of repeated trauma, patients with cancer may experience stress symptoms at any stage from diagnosis to completion of treatment or cancer recurrence (NCI, 2015b). PTSD has been increasingly diagnosed as a comorbidity among patients with cancer (Mulligan Elizabeth, Wachen, Naik, &

Jeffrey Gosian, 2014). About 9.6% of the breast cancer patients develop PTSD symptoms, according to a recent meta-analysis (Wu, Wang, Cofie, Kaminga, & Liu, 2016). On the other hand, recent literature critiques PTSD diagnosis among patients with cancer, and recommends that other diagnoses should be considered (Cordova, Riba, & Spiegel, 2017). A 2019 qualitative research study in which 2141 patients were interviewed supports these critiques (Esser et al., 2019).

Cordova et al. (1995) was the first study to assess QoL and define PTSD-like symptoms in 55 women after breast cancer treatment. PTSD symptoms were negatively related to QoL, and PTSD prevalence was 5–10%. A large study of long-term breast cancer survivors (IARC, 2018, p. 083) reports psychosocial comorbidities such as PTSD (12%), and the association with QoL suggests the need for screening and psychosocial support services (Mehnert & Koch, 2008).

The literature review shows only one study in the Arab world, which reveals a high prevalence in PTSD assessment in breast cancer patients (Aqeel, Mushtaq, & Eman, 2019). There are no studies in the Arabic world, or in Palestine, that have assessed QoL and its relationship to PTSD symptoms among female cancer patients.

On the other hand, many of the studies that were conducted to assess the QoL among Arabic patients with cancer have found it to be low, and emphasized the importance of the psychological factors in treating these patients. For example, in Egypt, about 40% of women with breast cancer at an oncology centre had poor QoL (Haddou Rahou et al., 2016).

In addition, one study assessed the determinants of the QoL in Palestinian patients with cancer in general, and the findings showed poor health-related QoL. It also showed a low mean score for global quality of life (GQoL) (41.8) and other functional domains, such as physical, role, and emotional scales, which were below half of full functioning (48.5, 48.8, and 46, respectively). The study authors recommended that the psychological services be integrated into the Palestinian healthcare system for patients with cancer to improve their QoL and reduce their suffering (European Organisation for Research and Treatment of Cancer [EORTC], 2001).

Alawadi and Ohaeri (2009) found a low QoL of 348 patients with breast cancer aged between 20 and 81 years. The study concluded that psychosocial prognosis in Arab patients with cancer is an important aspect of their treatment plan, and recommended the institution of a psycho-oncology service to address the psychosocial issues (Weathers et al., 2013).

In summary, the serious psychological (e.g. PTSD) and social burdens of cancer diagnosis on Palestinian women go further than the physical effects, and greatly influence their QoL (Palestinian Ministry of Health, 2018) because of the fragmentation of the health system, a high rate of premature deaths, the lack of psychological services in the treatment settings, and the complex pathways that women with breast cancer care have to navigate to receive their treatment.

Therefore, the purpose of this study is to assess the QoL and the prevalence of PTSD symptoms among adult female patients with cancer attending Beit-Jala Governmental Hospital in the Bethlehem district in Palestine.

## 2. Materials and methods

This cross-sectional study included 253 female patients with cancer in the Oncology Department at the Beit-Jala Governmental Hospital in Bethlehem city.

Sample-size calculations, based on the expected prevalence of PTSD among patients with breast cancer of 9%, a 95% confidence interval (CI), and a 5% absolute precision on either side of the proportion, indicated that the minimum required sample size was 117 patients. Assuming a non-response rate of 50%, 175 female patients would represent an adequate sample.

The questionnaire consisted of three sections. The first section included socio-demographic characteristics (marital status, place of residence, educational level, and economic status) and the patient's medical history (cancer type, cancer treatment, and the onset of cancer diagnosis). To exclude previous psychological problems such as exposure to trauma or childhood maltreatment and neglect, several questions that assessed the psychological history of the participants were added. For example, the participants were asked whether they suffered from any psychological problems before their cancer diagnosis, what those problems were, what type of psychological treatment(s) they had received, and whether they had considered harming themselves after they had been diagnosed with cancer. Their answers were negative for all of these questions as none of the participants reported having any psychological problems before their cancer diagnosis. Moreover, none of them reported thinking about harming themselves after being diagnosed with cancer.

The second section included the most recent version of the European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQ-C30, version 3.0). This is composed of multi-item scales which measure the QoL of cancer patients using five functional scales (physical, role, cognitive, emotional, and social functioning), three symptom scales (pain, fatigue, nausea and vomiting), and six single items (dyspnoea, insomnia, loss of appetite, constipation, diarrhoea, and financial impact). The four-point Likert-type response categories are 'not', 'a little', 'quite a bit', or 'very much'. Items measuring global health and QoL perception have seven-point response scales (EORTC, 2001). The scoring algorithm recommended by the EORTC transforms the responses to values on a scale of 0–100%. For the functional scales and GQoL, a higher score corresponds to better functioning and QoL. For symptom scales, a higher score corresponds to more frequent and/or more intense symptoms (EORTC, 2001).

Finally, the third section was a post-traumatic disorder checklist, measuring PTSD symptoms. The PTSD Checklist specific version (PCL-S) is a 17-item scale based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria, which is very similar to PCL-5 in DSM-5 (Weathers et al., 2013). It is a self-administered instrument that assesses symptoms using Likert-type responses (1: ‘not at all’, 2: ‘a little bit’, 3: ‘moderately’, 4: ‘quite a bit’, and 5: ‘extremely’) (Blanchard, Jones-alexander, Buckley, & Forneris, 1996). The PCL is scored by summing all items for a total of severity score (Weathers, Huska, & Keane, 1991). The score ranges from 17 to 85, with a diagnostic cut-off score of 50 indicating the diagnosis of clinically significant PTSD (EORTC, 2001). A score of 1–18 indicates no PTSD symptoms, 19–34 indicates mild symptoms, 35–52 indicates moderate symptoms, and 53–85 indicates severe symptoms (Weathers et al., 1991). The content validity of our questionnaires was examined by a committee of four professionals in mental and public health. No changes were recommended.

The study was conducted in Beit-Jala Governmental Hospital, which is the main hospital in the governance and serves as a referral centre for cancer diagnosis and treatment in southern Palestine. Female patients with cancer, aged 18 years and older, who receive care in the oncology outpatient clinics and Day Care Unit at the Central Oncology Hospital in Palestine were recruited.

Written informed consent was obtained, and confidentiality and privacy were assured for all participants. Al-Quds University Review Board granted ethical approval for the study.

### 2.1. Data analysis

SPSS version 20 was used for data analysis. Descriptive analyses (frequencies and means) of the sample’s characteristics were computed. The relationships between background variables (socio-demographic variables, cancer type, and treatment) and both QoL and PTSD were examined with one-way analysis of variance (ANOVA) and the *t*-test for continuous variables. Tukey’s post-hoc test was used after ANOVA significance had been calculated to determine how the specific groups’ means compared to one another. The chi-squared test was used to assess the relationship between PTSD groups and the background variables. Correlations were used to measure the association between symptoms, QoL domains, and PTSD scores. Predictors of PTSD severity were assessed using logistic regression. Cronbach’s alpha was 88.6 for the QoL scale and 89.9 for PTSD, which indicated good reliability.

## 3. Results

### 3.1. Socio-demographic and clinical characteristics

A total of 253 patients were recruited to participate in the study. Table 1 shows the socio-demographic and clinical characteristics of the participants. The mean age was 52.6 years, with a range of 20–81 years. The majority were married (77.9%, $n = 197$). Most had breast cancer (85%, $n = 215$) and 15% ($n = 38$) had other types of cancer, including colon, stomach, bone, endometrial, liver, biliary, thyroid, ovarian, leukaemia, and lymphoma.

### 3.2. Means of EORTC QoL domains

The mean for GQoL was 57.4 (*SD* = 18.9) and the mean for physical functioning was 48.5 (*SD* = 26.30). Both were lower than average. On the other hand, the mean for role functioning was 64.3 (*SD* = 31.7), for emotional functioning was 77.8 (*SD* = 27), and for cognitive functioning was 77 (*SD* = 25.7). The mean for social functioning was 87.7 (*SD* = 24.6), which was higher than all the other domains. The mean of the financial impact of cancer on QoL was 25.2 (*SD* = 31.5).

On the symptoms scale, insomnia, fatigue, and loss of appetite were the most troublesome to participants. Pain, constipation, and dyspnoea came in second,

**Table 1.** Socio-demographic and clinical characteristics of the participants.

| Variable | | Frequency | Percentage (%) |
|---|---|---|---|
| Age (years) | 18–40 | 49 | 19.4 |
| | 41–50 | 62 | 24.5 |
| | 51–60 | 66 | 26.1 |
| | > 61 | 76 | 30 |
| Marital status | Single | 17 | 6.7 |
| | Married | 197 | 77.9 |
| | Widow | 39 | 15.4 |
| Educational level | Illiterate | 103 | 40.7 |
| | Primary | 55 | 21.7 |
| | Secondary | 63 | 24.9 |
| | University | 32 | 12.6 |
| Place of residence | City | 95 | 37.5 |
| | Village | 148 | 58.5 |
| | Camp | 10 | 4 |
| Cancer type | Breast | 251 | 85 |
| | Others | 38 | 15 |

while nausea and vomiting were of the least concern (Table 2).

### 3.3. PTSD Checklist (PCL-S) results

PTSD symptoms are considered to be clinically significant when the PCL-S score is 50 or above. The prevalence of PTSD among our participants using the cut-off of 50 was 3% ($n = 8$). In addition, the participants had PTSD symptoms based on the PTSD symptom score categories; 2% ($n = 5$) of participants had severe PTSD symptoms, 23.3% ($n = 59$) had moderate, and 68.8% ($n = 174$) had mild symptoms. PTSD symptoms were absent in only 5.9% ($n = 15$) of the study participants (Table 3).

### 3.4. Factors associated with QoL and PTSD scale scores

Statistically, there were significant relationships ($p < 0.05$) between the QoL domains and age group, educational level, and cancer type and treatment. ANOVA showed that the only significant differences between the means of GQoL, cognitive functioning, role function, and physical functioning were attributed to age ($p < 0.05$), in favour of the younger age group, whereas social functioning was found to be in favour of the older age group (Table 4).

**Table 2.** Means and standard deviations for global quality of life (GQoL), functional, and symptoms domains in the quality of life questionnaire.

| QoL domains | Mean | *SD* |
|---|---|---|
| Global quality of life (GQoL) | 57.4 | 18.9 |
| Functional domains† | | |
| Physical functioning (PF) | 48.5 | 26.3 |
| Role functioning (RF) | 64.3 | 31.7 |
| Emotional functioning (EF) | 77.8 | 27 |
| Cognitive functioning (CF) | 77 | 25.7 |
| Social functioning (SF) | 87.7 | 24.6 |
| Symptoms‡ | | |
| Fatigue (FA) | 36.7 | 26.3 |
| Nausea and vomiting (NV) | 15.1 | 22.5 |
| Pain (PA) | 27.2 | 26 |
| Dyspnoea (DY) | 24.1 | 31.3 |
| Insomnia (SL) | 37.4 | 39.5 |
| Loss of appetite (AP) | 35.4 | 36.4 |
| Constipation (CO) | 27 | 35.4 |
| Diarrhoea (DI) | 11.5 | 23 |
| Financial difficulties (FI) | 25.2 | 31.5 |

†Higher means indicate better GQoL and functioning.
‡Higher means indicate higher symptom severity and worse financial difficulties.

**Table 3.** Prevalence of post-traumatic stress disorder (PTSD) and severity of PTSD symptoms based on the PTSD Checklist specific version (PCL-S).

| PCL-S | | | |
|---|---|---|---|
| Clinical PTSD symptoms using cut-off point of 50 | | | |
| | | Frequency | Percentage (%) |
| No PTSD | | 248 | 97 |
| PTSD | | 8 | 3 |
| Total | | 253 | 100 |
| Severity of PTSD symptoms | | | |
| PTSD severity | PCL-S score | Frequency | Percentage (%) |
| No PTSD | (1–18) | 15 | 5.9 |
| Mild | (19–34) | 174 | 68.8 |
| Moderate | (35–52) | 59 | 23.3 |
| Severe | (53–85) | 5 | 2 |
| Total | | 253 | 100 |

The results of the $t$-test demonstrated a significant difference between the means of physical functioning, role functioning, and social functioning ($p < 0.05$) attributed to cancer type. Patients with breast cancer had better physical functioning, role functioning, and social functioning than those with other types of cancer.

Significant relationships ($p < 0.05$) were found among PTSD severity, age group, and cancer type. In general, if PTSD symptoms were present in the younger age group, they were most likely to exist in the moderate range. Thus, patients with other types of cancer (colon, stomach, bone, endometrium, liver, biliary, thyroid, ovarian, leukaemia, and lymphoma) had more PTSD symptoms than those with breast cancer. On the other hand, there were no statistically significant relationships among PTSD, marital status, educational level, place of residence, cancer treatment, or length of cancer diagnosis (Table 5).

### 3.5. Relationships between QoL and PTSD

Significant negative relationships were found between PTSD and physical function ($r = -0.32$), role function ($r = -0.38$), social functioning ($r = -0.48$), emotional functioning ($r = -0.57$), and cognitive functioning domains ($r = -0.23$), and the GQoL ($r = 0.46$). This means that while GQoL and the functional domains were decreasing, PTSD symptoms were increasing at the same time. The strongest relationship was with emotional functioning; when emotional functioning decreased, PTSD symptoms increased (Table 6).

On the other hand, there were significant positive relationships between PTSD and pain ($r = 0.43$), fatigue ($r = 0.48$), nausea and vomiting ($r = 0.28$), dyspnoea ($r = 0.20$), insomnia ($r = 0.52$), loss of appetite ($r = 0.40$), and constipation ($r = 0.31$). As these symptoms increased, PTSD symptoms increased as well. The strongest relationship was with insomnia, while the weakest was with dyspnoea. There was a significant positive relationship between PTSD and financial impact ($r = 0.21$); as cancer impacted a patient's finances, her PTSD symptoms increased (Table 6).

### 3.6. Predictors of PTSD symptom severity

Multivariate logistic regression was performed to control confounders and assess predictors of PTSD symptom severity. Consequently, variables were adjusted and all possible confounders were controlled. Age, physical and emotional functions, and insomnia were

**Table 4.** Relationships between the quality of life (QoL) domains [physical, role, social, emotional, cognitive functions, and global quality of life (GQoL)] and socio-demographic and cancer medical history (ANOVA and *t*-test).

| | | | Functional scales in EORTC QoL | | | | |
|---|---|---|---|---|---|---|---|
| Characteristic | | GQoL | Physical function | Role function | Social function | Emotional function | Cognitive function |
| Age (years) | 20 to < 40 | 56.29 (24.6) | 61.36 (27.2) | 64.63 (35.1) | 79.25 (29.6) | 68.54 (31.9) | 90.48 (17.7) |
| | 40 to < 50 | 63.44 (17.0) | 56.77 (24.5) | 74.19 (28.7) | 86.56 (28.4) | 78.36 (25.5) | 85.75 (22.8) |
| | 50 to < 60 | 59.22 (17.7) | 43.74 (22.2) | 65.40 (30.9) | 90.91 (19.9) | 79.80 (27.1) | 77.27 (26.9) |
| | ≥ 60 | 51.64 (15.3) | 37.63 (25.1) | 55.04 (30.2) | 91.23 (20.1) | 81.69 (23.9) | 63.16 (24.4) |
| | *p* | 0.001 | 0.001 | 0.01 | 0.03 | 0.54 | 0.001 |
| Educational level | Illiterate | 55.1 (15.2) | 40.78 (23.8) | 60.36 (29.9) | 91.59 (21.4) | 83.50 (22.9) | 71.04 (24.6) |
| | Primary | 58.64 (20.6) | 49.33 (26.1) | 65.45 (34.6) | 88.79 (24.0) | 75.15 (24.8) | 81.21 (23.6) |
| | Secondary | 56.61 (19.5) | 53.02 (25.6) | 69.31 (28.4) | 83.33 (27.3) | 72.22 (30.1) | 76.72 (29.9) |
| | University | 64.32 (23.7) | 63.13 (28.1) | 65.10 (37.5) | 81.77 (28.2) | 75.26 (33.5) | 94.79 (12.3) |
| | *p* | 0.10 | 0.001 | 0.35 | 0.09 | 0.04 | 0.001 |
| Marital status | Single | 55.39 (25.8) | 52.16 (27.8) | 48.04 (43.2) | 77.45 (26.3) | 75.49 (33.3) | 96.08 (9.4) |
| | Married | 58.54 (19.1) | 50.32 (26.1) | 67.60 (30) | 88.24 (24.9) | 76.65 (27.5) | 79.19 (25.4) |
| | Widow | 52.56 (12.4) | 37.78 (24.2) | 54.70 (30.8) | 89.32 (21.1) | 84.83 (20.6) | 61.97 (24.5) |
| | *p* | 0.18 | 0.02 | 0.01 | 0.20 | 0.21 | 0.001 |
| Type of cancer | Breast cancer | 58.26 (18.5) | 50.67 (25.4) | 66.67 (30.3) | 89.38 (21.5) | 78.29 (26.8) | 78.22 (25.2) |
| | Other | 52.63 (20.3) | 36.32 (28.3) | 50.88 (36.1) | 78.07 (36.6) | 75.22 (28.2) | 74.56 (28.7) |
| | *p* | 0.09 | 0.001 | 0.001 | 0.01 | 0.52 | 0.42 |
| Cancer treatment | Chemotherapy | 59.23 (20.6) | 49.40 (30.4) | 65.18 (34.3) | 88.39 (25.0) | 80.95 (24.9) | 81.55 (26.3) |
| | Chemotherapy and surgery | 57.44 (18.1) | 48.95 (24.7) | 65.33 (30.2) | 88.24 (23.3) | 77.09 (27.8) | 77.09 (25.3) |
| | Other treatment modalities | 46.67 (20.5) | 35.33 (29.9) | 40.00 (37.8) | 73.33 (40.9) | 74.17 (23.7) | 66.67 (27.2) |
| | *p* | 0.15 | 0.27 | 0.05 | 0.17 | 0.59 | 0.20 |
| Onset of diagnosis (months) | < 6 | 60.60 (18.6) | 50.04 (27.7) | 66.67 (31.1) | 87.65 (26.2) | 82.30 (25.6) | 77.98 (25.3) |
| | 6 to < 12 | 57.00 (19.9) | 49.65 (24.5) | 64.54 (32.1) | 88.30 (22.2) | 75.00 (27.5) | 82.80 (24.0) |
| | 12 to < 24 | 55.34 (17.1) | 46.98 (27.5) | 61.46 (32.9) | 89.32 (22.1) | 77.99 (27.3) | 71.61 (26.5) |
| | ≥ 24 | 51.19 (19) | 39.05 (24.8) | 61.90 (28.8) | 76.19 (37.9) | 70.24 (28.9) | 69.05 (29.9) |
| | *p* | 0.20 | 0.48 | 0.79 | 0.34 | 0.23 | 0.03 |

Note: Data are shown as mean (*SD*).
ANOVA, anlysis of variance; EORTC, European Organisation for Research and Treatment of Cancer.

**Table 5.** Chi-squared results of the relationships and differences in post-traumatic stress disorder (PTSD) severity due to socio-demographic and cancer medical history.

| Variable/category | | | No PTSD | Mild PTSD | Moderate PTSD | Severe PTSD | p |
|---|---|---|---|---|---|---|---|
| Age (years) | 20 to < 40 | % | 12.2% | 46.9% | 38.8% | 2.0% | 0.02 |
| | | Std. residual | 1.8 | −1.8 | 2.2 | 0 | |
| | 40 to < 50 | Count % | 3.2% | 72.6% | 21.0% | 3.2% | |
| | | Std. residual | −0.9 | 0.4 | −0.4 | 0.7 | |
| | 50 to < 60 | Count % | 7.6% | 69.7% | 21.2% | 1.5% | |
| | | Std. residual | 0.5 | 0.1 | −0.4 | −0.3 | |
| | ≥ 60 | Count % | 2.6% | 78.9% | 17.1% | 1.3% | |
| | | Std. residual | −1.2 | 1.1 | −1.1 | −0.4 | |
| Cancer type | Other CA | Count% | 2.6% | 57.9% | 36.8% | 2.6% | 0.04 |
| | | Std. residual | −0.8 | −0.8 | 1.7 | 0.3 | |
| | Breast cancer | Count % | 6.5% | 70.7% | 20.9% | 1.9% | |
| | | Std. residual | 0.4 | 0.3 | −0.7 | −0.1 | |
| Marital status | Single | % | 5.9% | 70.6% | 23.5% | 0.0% | 1.00 |
| | | Std. residual | 0.0 | 0.1 | 0.0 | −0.6 | |
| | Married | % | 6.1% | 68.0% | 23.4% | 2.5% | |
| | | Std. residual | 0.1 | −0.1 | 0.0 | 0.6 | |
| | Widow | % | 5.1% | 71.8% | 23.1% | 0.0% | |
| | | Std. residual | −0.2 | 0.2 | 0.0 | −0.09 | |
| Educational level | None | % | 4.9% | 76.7% | 17.5% | 1.0% | 0.11 |
| | | Std. residual | −0.4 | 1.0 | −1.2 | −0.7 | |
| | Primary | % | 5.5% | 69.1% | 20.0% | 5.5% | |
| | | Std. residual | −0.1 | 0.0 | −0.5 | 1.8 | |
| | Secondary | % | 4.8% | 58.7% | 34.9% | 1.6% | |
| | | Std. residual | −0.4 | −1.0 | 1.9 | −0.2 | |
| | Higher | % | 12.5% | 62.5% | 25.0% | 0.0% | |
| | | Std. residual | 1.5 | −0.4 | 0.2 | −0.8 | |
| Treatment | Chemotherapy | % | 7.1% | 67.9% | 23.2% | 1.8% | 0.59 |
| | | Std. residual | 0.4 | −0.1 | 0.0 | −0.1 | |
| | Chemotherapy and surgery | % | 5.9% | 68.4% | 24.1% | 1.6% | |
| | | Std. residual | 0.0 | −0.1 | 0.2 | −0.4 | |
| | Other treatment modalities | % | 0.0% | 80.0% | 10.0% | 10.0% | |
| | | Std. residual | −0.8 | 0.4 | −0.9 | 1.8 | |
| Length of diagnosis (months) | < 6 | % | 8.6% | 63.0% | 25.9% | 2.5% | 0.54 |
| | | Std. residual | 1.0 | −0.6 | 0.5 | 0.3 | |
| | 6 to < 12 | % | 4.3% | 68.1% | 26.6% | 1.1% | |
| | | Std. residual | −0.7 | −0.1 | 0.7 | −0.6 | |
| | 12 to < 24 | % | 6.3% | 75.0% | 17.2% | 1.6% | |
| | | Std. residual | 0.1 | 0.6 | −1.0 | −0.2 | |
| | ≥ 24 | % | 0.0% | 78.6% | 14.3% | 7.1% | |
| | | Std. residual | −0.9 | 0.4 | −0.7 | 1.4 | |

the significant predictors of PTSD severity. Participants with severe PTSD symptoms were older and had better physical functioning, while those with higher emotional functioning had lower PTSD symptom levels. Finally, participants who reported insomnia were most likely to have severe PTSD symptoms (Table 7) (Quinn et al., 2015).

## 4. Discussion

QoL in the current study (57.4%) is low in comparison with the female international reference value determined by EORTC (59.3%). However, this difference is higher than in other national studies in the region, which showed a mean GQoL of 41.8% for Palestinian patients with cancer (Imam & Khleif, 2013) and 45.3% for breast cancer patients in Kuwait (Alawadi & Ohaeri, 2009). On the other hand, patients with breast cancer in Turkey had a higher GQoL (62.8%) (Demirci et al., 2011) than in the current study.

Large cohort studies of women with breast cancer, such as the US Nurses' Health study, which studied 122,969 patients, of whom 1082 were diagnosed with breast cancer, documented a decline in health-related QoL in multiple domains, including physical roles, pain, social functioning, and psychosocial dimensions, after the breast cancer diagnosis (Kroenke et al., 2004). In our study, the physical domain had a negative impact on QoL and a mean of 48.4%, which was much lower than the female international reference value created by EORTC (74.4%). Ferrell, Dow, and Grant (1995) found that cancer survivors had several problematic physical effects that influenced their ability to function and negatively influenced their overall QoL. The most common symptoms that affected physical well-being were pain and fatigue, while others included the psychological along with the physical domain as being troublesome to the QoL of patients with cancer (Pinar, Salepc, & Affiar, 2003).

The high social and emotional functioning in our study may be attributed to the fact that social supports (family members and friends) are strong. Local cultural values of the nuclear family and extended family

**Table 6.** Adjusted relationships between post-traumatic stress disorder (PTSD) symptoms and quality of life[†].

| Dependent variable | Multiple correlation | *r*-square | *F*-value ANOVA | *p*-value | *B*-value (regression) | *p*-value |
|---|---|---|---|---|---|---|
| Physical function | 0.53 | 0.28 | 23.93 | 0.00 | −15.28 | 0.001* |
| Role function | 0.46 | 0.21 | 16.29 | 0.00 | −20.82 | 0.001* |
| Social functioning | 0.52 | 0.27 | 22.68 | 0.00 | −19.15 | 0.001* |
| Emotional functioning | 0.58 | 0.34 | 31.76 | 0.00 | −26.49 | 0.001* |
| Cognitive functioning | 0.49 | 0.24 | 19.70 | 0.00 | −11.83 | 0.001* |
| Pain | 0.50 | 0.25 | 20.55 | 0.00 | 18.82 | 0.001* |
| Fatigue | 0.56 | 0.31 | 28.08 | 0.00 | 21.38 | 0.001* |
| Nausea and vomiting | 0.35 | 0.12 | 8.72 | 0.00 | 9.85 | 0.001* |
| Dyspnoea | 0.28 | 0.08 | 5.17 | 0.00 | 11.73 | 0.001* |
| Insomnia | 0.55 | 0.30 | 26.81 | 0.00 | 34.50 | 0.001* |
| Loss of appetite | 0.46 | 0.21 | 16.59 | 0.00 | 25.98 | 0.001* |
| Constipation | 0.43 | 0.18 | 13.95 | 0.00 | 19.16 | 0.001* |
| Diarrhoea | 0.19 | 0.04 | 2.25 | 0.07 | −3.19 | 0.16 |
| Financial impact | 0.28 | 0.08 | 5.10 | 0.00 | 11.92 | 0.001* |
| Global quality of life | 0.50 | 0.25 | 20.56 | 0.00 | −15.16 | 0.001* |

[†] Independent variable: PTSD symptoms; adjusted for age, cancer type, and treatment.
*Significant at the 0.05 level.

**Table 7.** Logistic regression: predictors of post-traumatic stress disorder symptom severity.

| | *β* | *SE* | Adjusted OR | *p* |
|---|---|---|---|---|
| Age | 0.25 | 0.13 | 1.3 | 0.05* |
| Cancer type | 0.15 | 1.8 | 1.01 | 0.9 |
| Physical function | 0.23 | 0.11 | 1.3 | 0.03* |
| Role function | −0.03 | 0.04 | 1 | 0.4 |
| Social functioning | −0.03 | 0.02 | 0.96 | 0.2 |
| Emotional functioning | −0.13 | 0.06 | 0.8 | 0.03* |
| Cognitive functioning | 0.06 | 0.04 | 1.1 | 0.1 |
| Pain | 0.07 | 0.07 | 1.1 | 0.3 |
| Fatigue | 0.02 | 0.05 | 1 | 0.6 |
| Nausea and vomiting | −0.07 | 0.05 | 0.9 | 0.1 |
| Dyspnoea | 0.03 | 0.02 | 1 | 0.2 |
| Insomnia | 0.12 | 0.62 | 1.2 | 0.05* |
| Loss of appetite | 0.04 | 0.03 | 1.04 | 0.3 |
| Constipation | 0.02 | 0.027 | 1.02 | 0.2 |
| Diarrhoea | 0.02 | 0.5 | 1 | 0.8 |
| Financial impact | −0.003 | 0.03 | 0.97 | 0.4 |
| Global quality of life | −0.0.3 | 0.36 | 0.97 | 0.4 |

OR, odds ratio.
*Significant at the 0.05 level.

provide substantial support. Other research shows the value of emotional, informational, and logistical support, in addition to their impact on improved emotional functioning (Adler, 2008). Cancer patients are often told that they should ‘think positively’ and ‘fight cancer’, which may result in their perceiving that by expressing fear or sadness they would be considered ‘weak’. Furthermore, some patients fear that negative emotions may adversely affect their immune system. Processing these emotions may lead to a stronger emotional position, whereas suppressing them may increase the risk of depression and lead to sleep difficulties (Leano, Korman, Goldberg, & Ellis, 2019).

Insomnia was the most commonly reported symptom, followed by fatigue and loss of appetite. Studies show that rates of fatigue among women with cancer vary greatly, ranging from 4% in patients with breast cancer before the start of chemotherapy to 91% in breast cancer patients after surgery and chemotherapy (Carr et al., 2002). While insomnia was reported to be 18.46% in patients with breast cancer, clinically significant insomnia was highly associated with joint pain, hot flushes, age, and anxiety and depression since the breast cancer was first diagnosed (Desai et al., 2013).

Prevalence rates of PTSD varied widely depending on the method of assessment. Studies using self-reported PTSD symptoms measured yielded prevalence estimates of clinically significant symptom levels from 7.3% (95% CI 4.5–11.7; 10 studies) to 13.8% (9.5–19.6; 11 studies) depending on the screening and scoring method used (Abbey, Thompson, Hickish, & Heathcote, 2015). Other studies showed a higher percentage of PTSD symptoms than in healthy people. For example, a study conducted in Germany to measure psychosocial comorbidity and QoL, which assessed PTSD with the PTSD Checklist civilian version (PCL-C), revealed PTSD rates of 12% in long-term breast cancer survivors (Aqeel et al., 2019). Another study that looked at PTSD prevalence using DSM-IV criteria, which is the same tool that we used, showed that the prevalence changed, being lower in early diagnosis and increasing at 4 years and upwards (Chan et al., 2018). In our study, PTSD, as a clinically significant diagnosis using the cut-off score of 50, as recommended (Aqeel et al., 2019), shows a lower prevalence at 3%, and more severe symptoms among participants with cancers other than breast cancer. However, most of our participants had PTSD symptoms and only 5.9% reported no symptoms. Our study indicates that a better QoL is associated with lower PTSD symptoms. It also shows that the main predictors of PTSD severity are age, physical functioning, emotional functioning, and sleep pattern. The same association was expressed in a study conducted in the USA, where health-related QoL was significantly associated with PCL-C scores (Hahn et al., 2015). ‘Cancer’, which is usually associated with chemotherapy, hair loss, nausea, and other physical symptoms, has a significant emotional impact on patients. A study in Eastern Europe found that 40% of patients with cancer experience significant emotional distress during treatment, which is significantly associated with PTSD symptoms (Pranjic, Bajraktarevic, & Ramic, 2016).

Therefore, interventions for moderate PTSD symptoms should concentrate on improving psychological well-being. Successful interventions have aimed to improve psychosocial involvement, psychological understanding, and religious involvement (Desai et al., 2013), and have been implemented early (Levine, Eckhardt, & Targ, 2005). In addition, results show significant positive relationships between pain, fatigue, nausea and vomiting, dyspnoea, insomnia, loss of appetite, and constipation and PTSD. Thus, the increase in the severity of cancer symptoms was associated with an increase in the PTSD symptoms score. Jones (2001) highlighted that as the physical symptoms of the disease decrease, the symptoms of psychological distress will resolve over time in the majority of women.

Our findings indicate that PTSD symptoms interfere with patient functioning. Therefore, it is the responsibility of health practitioners to educate the patients, their family members, and caregivers regarding normal and expected symptoms related to diagnosis and treatment, including the range of emotional responses. The American Cancer Society recommends that healthcare workers should provide patients with safe and competent care, including a comprehensive psychosocial assessment for PTSD, individualized interventions, and referral when appropriate (American Cancer Society, 2009).

## 5. Conclusion and limitations

It is important that female patients with cancer undergo a careful assessment for PTSD, as well as the various components that support QoL, such as social and emotional supports as well as adequate treatment of pain. Timely identification and treatment may improve QoL.

The study utilizes a quick assessment of PTSD prevalence, which is based on the DSM-IV and does not include all of the DSM-5 diagnostic criteria (Haddou Rahou et al., 2016; Weathers et al., 2013). It is impossible to repeat the data collection or to analyse the PTSD criteria in the checklist for the DSM-5 criteria. The DSM-5 criteria pay more attention to the behavioural symptoms that accompany PTSD and propose four distinct diagnostic clusters instead of three (APA, 2013). This may have captured more symptomology in our participants, thus increasing the scores. The nature of the cross-sectional design also makes it impossible to compare how factors change over time. Despite these limitations, we present important findings for an area of the world where there has been little research on women and breast cancer related to QoL and PTSD. Our findings shows that the strong social support in the local culture appears to improve the QoL for cancer patients. Future research may look at PTSD and QoL differences at different intervals in the diagnosis, or how interventions could improve patient function.

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## Authors' contributions

B.M. and M.A. conceptualized and designed the study. They were responsible for the literature review, data collection, data analysis, data interpretation, manuscript writing, and original draft preparation and editing. M.A. supervised all aspects of the work.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Data availability statement

The data supporting the findings of this study are available on request from the corresponding author, MA. The data are not publicly available owing to ethical restrictions because this study was conducted in a governmental hospital which prevents the sharing of data as it could compromise the privacy of research participants.

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