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A Study of Depression, Quality of Life and Breast Cancer

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Abstract

Breast cancer and its subsequent treatment are a great source of anxiety and depression in patients. However, it remains unclear whether this decrease in mental and physical health is temporary or if long-term effects would appear once the patient is well out of these stressful times. Methods: a total of 204 women were included in the present analysis. Participants were recruited at tertiary care hospital (EL- Maadi oncology hospital). Results: the mean age of the included patients was 56.76 ±17.5 years old; almost one-third of them aged between 51-60 years old. In our cohort, the mean BDI-II was 15.4 ±29.4. A total of 48 patients (22.5%) had depression. Of them, 13 patients had mild depression (6.4%), 14 patients had moderate depression (6.9%), 9 patients had severe depression (4.4%), and 10 patients had extreme depression (4.9%). there were statistically significant associations between presence of depression and overall WHOQOL-BREF score ($p<0.001$), physical domains ($p <0.001$), psychological health ($p <0.001$), social relation ($p <0.001$), and environment score ($p <0.001$); depressed patients exhibited lower scores in all of these domains than non-depressed patients. Conclusion: breast cancer is often accompanied by severe psychological distress, which is associated with a significant prevalence of anxiety and depression disorders in the course of the disease. Depression may reduce the efficacy of chemotherapy, and therefore the survival chances of cancer patients. This study provided evidence that depressive symptoms in patients with breast cancer undergoing treatments detrimentally affected various aspects of the QOL in a real- world setting.

Keywords: Depression, Quality, Life, Breast, Cancer.

1. Introduction

Breast cancer is the most common cancer in developed countries among women. According to the World Health Organization (WHO), breast cancer represents 10% of all cancers diagnosed worldwide annually[1].

About 2.1 million women worldwide are diagnosed with breast cancer annually. This type of cancer is the second major cause of cancer death in women after lung cancer. In 2018, it was estimated that 627,000 women died from breast cancer, which was 15% of all cancer deaths among women. Although breast cancer rates are higher among women in more developed countries, its rate is increasing in nearly every region globally[2].

Breast cancer in women is associated with more severe psychological and emotional effects than other types of cancer. Despite the widespread advances in the detection and treatment of breast cancer, the resulting pain, fear of death, reduced functional capacity, adverse effects of treatment, and lack of financial and social support have increased the propensity for mental disorders in these cancer patients[3].

Many women develop depression over the course of cancer detection and treatment. Depression is a common comorbidity of cancer that has a detrimental effect on the quality of life, treatment adherence, and potential survival. Cancer patients are particularly susceptible to contemplate suicide and self-harm. The prevalence of depression in women with breast cancer varies between 1.5% and 50%. For example, a 2017 study reported that the prevalence of depression was 22% in women with breast cancer in an Indian city[4].

Also, another study in China (2009) indicated that 26% of women with breast cancer suffered from depression symptoms[5].

The emotional response of women to breast cancer ranges from mild mood changes to severe anxiety and depression. Women diagnosed with breast cancer need time to adjust and return to "normal." However, about 20% to 30% of breast cancer patients experience anxiety, depression, impaired functioning, and low self-esteem following diagnosis. Given the time and method of examination, these effects can persist for a long period of time after detection and treatment and are more common in younger women[6].

Depression reduces the quality of life of breast cancer patients in all fields except family functioning. Treatment of depression in women with breast cancer improves their quality of life and may extend their lifespan[3].

We aimed to assess depression and its association with QOL in patients with breast cancer.

2. Patients and methods

The present study included adult breast cancer patients who were diagnosed with breast cancer and underwent surgery, chemotherapy, radiotherapy, or a combination of therapies and after treatment or surgery.

All patients fulfilling the inclusion criteria and accept to participate were included in the study.

2.1Inclusion criteria

- Patients aged above 18 years who were diagnosed with breast cancer and are undergoing surgery or chemotherapy or radiotherapy or a combination of therapies.
- Patients with a family history of mood disorder or other psychiatric disorder were included in this study.

2.2Exclusion criteria:

- Patients with current psychiatric disorders or cognitive deficits and with hearing or visual impairments were excluded from the study.
- Patients in the intensive care unit (ICU).
- Patients refused to sign the written informed consent for our study.

An informed written consent was obtained from the hospitalized patient before participation; it will include data about aim of the work, study design, site, time, subject, tool and confidentiality. An approval from Research Ethics Committee in Benha faculty of medicine was obtained.

2.3All patients were subjected to:

1) Socio – Demographic assessment to (sex, age, occupation, social, education … etc...)
2) Semi–structural interview: emphasizing the presence of organic illness, head trauma, family history of breast cancer, psychosis, ECT, personality changes, personality disorder, any psychotropic medications intake, substance abuse, and specific psychiatric symptoms. i.e.…
3) Clinical assessment of depression using DSM-IV criteria
4) Beck depression inventory-II: In the present study, we assessed the presence and severity of depression using BDI-II scale. The BDI is self- administrated well validated in normal and psychiatric populations, which contains 21 items rated on an intensity scale of 0–3 with a maximum score of 63. Categories of depressive symptom severity include minimal (0–13), mild (14–19), moderate (20–28), and severe (29–63)
5) The WHOQOL-BREF questionnaire was used to assess the QOL among all the patients. It contains a total of 26 items. It is used to assess the QOL among all the patients. It is possible to derive four domain scores. The four domain scores denote an individual's perception of QOL in each particular domain. The four domains are physical, psychological, social relationship, and environmental. Domain scores are scaled in a positive direction (i.e., higher scores denote higher QOL).

2.4 Statistical design

The Data were collected and entered to the computer using SPSS (Statistical Package for Social Science) program for statistical analysis. Data were entered as numerical or categorical, as appropriate. Two types of statistics were done: Quantitative data were shown as mean, SD, and range. Qualitative data were expressed as frequency and percent at 95% confidence interval (95% CI). Chi- square test and fisher exact test were used to measure association between qualitative variables. Student t-test and Mann Whitney test were done to compare means and SD of 2 sets of quantitative normally and not normally distributed data, respectively. Repeated measures ANOVA test and Friedman test was performed to differentiate changes in different follow up results of different studied quantitative variables normally and not normallydistributed data, respectively. The results of comparing the correlation between two continuous variables were indicated by the correlation coefficient (r) using correlation analysis. P (probability) value was considered to be of statistical significance if it is less than 0.05.

3. Results

A total of 250 adult, breast cancer, patients who were diagnosed with breast cancer were initially screened for inclusion in the present study. Of them, 46 patients were excluded due to current psychiatric disorders or cognitive deficits (n =13) or refused to sign the written informed consent (n=33). Thus, a total of 204 patients were included in the present analysis. The mean age of the included patients was 56.76±17.5 years old; almost one-third of them aged between 51-60 years old. The vast majority of the patients were females (99.1%) Table(1).

Table (1) The demographic characteristics of 204 patients who have been diagnosed with breast cancer according to age and gender.

Variables	BC Patients (N =204)
Age in years	
Mean ±SD	56.76 ±17.5
Median (IQR)	57 (29 -80)
Age Categories in years, No (%)	
• **18 – 30**	4 (1.9%)
• **31 – 40**	18 (8.8%)
• **41 – 50**	63 (30.8%)
• **51 – 60**	69 (33.8%)
• **61 – 70**	40 (19.6%)
• **71 – 80**	10 (4.9%)
Gender, No (%)	
Male	2 (0.9%)
Female	202 (99.1%)

*Data are presented as mean ±SD, median (Range), or number (%).

The mean BDI-II was 15.4 ±29.4. A total of 48 patients (22.5%) had depression. Of them, 13 patients had mild depression (6.4%), 14 patients had moderate depression (6.9%), 9 patients had severe depression (4.4%), and 10 patients had extreme depression (4.9%). table (2).

Table(2) The findings of BDI-II score and DSM IV Diagnosis of 204 patients who have been diagnosed with breast cancer.

Variables	BC Patients (N =204)
BDI-II score	
Mean ±SD	15.4 ±29.4
Median (IQR)	11 (5 – 53)
Diagnosis of depression, No (%)	
Yes	48 (22.5%)
No	156 (77.5%)
BDI-II Category, No (%)	
Normal	158 (77.5%)
Borderline clinical depression (Mild)	13 (6.4%)
Moderate depression	14 (6.9%)
Severe depression	9 (4.4%)
Extreme depression	10 (4.9%)
DSM IV Diagnosis, No. (%)	
Major Depressive Episode	33 (16.2%)
Minor Depressive Episode	13 (6.4%)
Dysthymic Disorder	1 (0.4%)

*Data are presented as mean ±SD, median (Range), or number (%).

The mean WHOQOL-BREF was 83.3 ±21.2. A total of 22 patients (10.8%) reported that they perceived their QoL as poor; while 34 patients (12.6%) were dissatisfied regarding their overall health Table (3).

Table (3) The findings of WHOQOL-BREF score of 204 patients who have been diagnosed with breast cancer.

Variables	BC Patients (N =204)
Overall WHOQOL-BREF score	
Mean ±SD	83.3 ±21.2
Median (IQR)	79 (45 – 96)
Physical health score	
Mean ±SD	11.9 ± 2.78
Median (IQR)	12 (7 – 17)
Psychological health score	
Mean ±SD	11.8 ± 3.07
Median (IQR)	12 (6 – 17)
Social relationships score	
Mean ±SD	13.47 ± 3.05
Median (IQR)	13 (8 – 19)
Environment score	
Mean ±SD	13.77 ± 1.92
Median (IQR)	13 (8 – 19)
Overall perception of OOL, No (%)	
Poor	22 (10.8%)
Neutral	58 (28.4%)
Good	124 (60.3%)
Overall perception of health, No (%)	
Dissatisfied to very dissatisfied	34 (12.6%)
Neutral	78 (28.9%)
Satisfied to very satisfied	109 (45.1%)

*Data are presented as mean ±SD, median (Range), or number (%).

There were statistically significant associations between presence of depression and overall WHOQOL-BREF score (p<0.001), physical domains (p <0.001), psychological healthy (p <0.001), social relation (p <0.001), and environment score (p <0.001); depressed patients exhibited lower scores in all of these domains than non-depressed patients, which indicated lower quality of life in depressed patients Table(4).

Table (4) The comparison of WHOQOL-BREF between depressed and non- depressed patients.

Variables	With depression (N	Without (N =158)	P-value
Overall WHOQOL-BREF score			
Mean ±SD	78.3 ±23.4	91.1 ±13.8	<0.001**
Median (IQR)	72 (45 – 84)	86 (68 – 96)	
Physical health score			
Mean ±SD	10.8 ± 3.08	13.1 ± 1.82	<0.001**
Median (IQR)	10 (7 – 13)	13 (11 – 17)	
Psychological health score			
Mean ±SD	10.1 ± 3.17	12.8 ± 2.57	<0.001**
Median (IQR)	9 (6 – 12)	12 (11 – 17)	
Social relationships score			
Mean ±SD	11.07 ± 3.19	13.86 ± 3.27	<0.001**
Median (IQR)	12 (8 – 13)	13 (10 – 19)	
Environment score			
Mean ±SD	10.77 ± 3.56	13.98 ± 1.53	<0.001**
Median (IQR)	10 (8 – 15)	14 (12 – 19)	

*Data are presented as mean ±SD, median (Range), or number (%). *Statistically significant, **Highly significant.

There was a statistically significant positive correlation between mean BDI score and all domains (Physical, psychological, social, environmental and overall) of WHOQO-BREF (p=0.001) Table (5).

Table (5) shows the correlation between the clinical characteristics and BDI score.

Variable	BDI-II
Age	
Correlation Coefficient (r)	-0.403
P-value	<0.001**
Overall WHOQOL-BREF score	
Correlation Coefficient (r)	0.903
P-value	<0.001**
Physical health score	
Correlation coefficient (r)	0.33
P-value	<0.001**
Psychological health score	
Correlation Coefficient (r)	0.48
P-value	<0.001**
Social relationships score	
Correlation Coefficient (r)	0.903
P-value	<0.001**
Environment score	
Correlation coefficient (r)	0.49
P-value	<0.001**

*Statistically significant; **Highly significant.

4. Discussion

In our study, the mean BDI-II was 15.4 ±29.4. A total of 48 patients (22.5%) had depression. Of them, 13 patients had mild depression (6.4%), 14 patients had moderate depression (6.9%), 9 patients had severe depression (4.4%), and 10 patients had extreme depression (4.9%).

The exact cause of high prevalence of depression among breast cancer cases unique psychosocial, medical and hormonal factors that may influence mood in breast cancer patients. Having breast cancer or receiving treatment has been seen as a traumatic experience to women due to its impacts on their self-image and sexual relationship, so most of the breast cancer patients have

psychological reactions such as denial, anger, or intense fear toward their disease and treatment process, and many of have psychiatric morbidities. Many of the breast cancer patients experience fatigue, depression, and/or anxiety months to years after their breast cancer diagnosis with these symptoms being associated with greater disability and a poorer quality of life[7].

In agreement with our findings, Purkayastha and colleagues [4] conducted a cross-sectional study enrolled 270 patients diagnosed with breast cancer (>18 years) and undergoing active treatment in a tertiary care center in Kerala, India. Of the 270 patients, 21.5% had depression. Among patients with depression, 22% had moderately severe to severe depression.

Similarly, Cordero and colleagues[8]performed an observational, descriptive, prospective, and transversal study of 120 female subjects who had been diagnosed and treated for breast cancer in 2009-2012 at the Centro Oncológico Estatal ISSEMyM [National Cancer Institute of México]. The prevalence of depression was 26%.

De Souza and colleagues[9]aimed to verify depressive symptoms and adherence to chemotherapy among women with breast cancer who are served by the Pharmacy of the Chemotherapy Center of a university hospital. This cross-sectional study with quantitative approach conducted with 112 women receiving chemotherapy. 12.50% and 1.78% of the patients experienced "moderate" and "severe" depression, respectively،

Akel and colleagues[10]conducted a cross-sectional study among female breast cancer patients diagnosed between January 2009 and March 2014, who were recruited from the outpatient clinics of Naef K. Basile Cancer Institute at the American University of Beirut Medical Center (AUBMC) from November 2015 till December 2016. A total of 150 patients were interviewed and 24.7% had depressive symptoms.

In the present study, the mean WHOQOL-BREF was 83.3 ±21.2. A total of 22 patients (10.8%) reported that they perceived their QOL as poor; while 34 patients (12.6%) were dissatisfied regarding their overall health.

The results of our study can be interpreted in the light of the adverse effects of breast cancer or treatment-related symptoms and types of treatment have been associated with different domains of QOL. High levels of depression in breast cancer can also influence coping with cancer and QOL adversely[4].

In concordance with our findings, Purkayastha and colleagues[4]reported that the average scores (mean ± SD) of physical, psychological, social relationships, and environmental domains in WHOQOL-BREF were 12.30 ± 1.68, 12.81 ± 1.72, 14.17 ± 2.75, and 14.37 ± 2.12, respectively. In response to the question “how would you rate your QOL? ,” 22 (8.1%) patients reported that their QOL was “poor,” 58 (21.5%) reported “neither poor nor good.” The proportion of patients who reported their QOL as “poor” was higher in depressed patients than those without depression.

Gangane and colleagues[11]assessed socio-demographic and clinical factors, as well as the role of self-efficacy, in relation to QOL among women with breast cancer in rural India. A total of 208 female patients with infiltrating carcinoma of the breast participated in the study. Patients with breast cancer had significant impairments in their quality of life.

An earlier study by Oliveira and colleagues[12] compared the WHOQOL-BREF with other cancer specific questionnaires and concluded that WHOQOL-BREF can be used to assess QOL in patients with breast cancer and that patients with breast cancer had significant impairments in their quality of life.

With regard to association analysis, our study demonstrated that there was statistically significant association between age of the patients and presence of depression ($p < 0.001$); depressed patients were more likely to be younger than non-depressed patients.

This suggests younger patients could be more vulnerable to the physical and psychological impact of breast cancer and have more specific concerns regarding sexual attractiveness, hair loss, and change in weight for example. As such, there is a greater need for supportive care services provided to this younger group.

In line with our findings, Akel and colleagues[10] showed that patients diagnosed before the age of 50 had significantly lower breast cancer subscale scores compared to those diagnosed above age 50.

This is consistent with a study performed in Canada using the FACT-B questionnaire, that showed young women < 50 years old with breast cancer were more likely to have a decreased QOL and increased depressive symptom burden than older women[13].

People with severe mental illness are more vulnerable to have a diminished health related quality of life, and depression takes a higher proportion. Thus, the nature of symptoms (loss of interest, depressed mood, lack of interest for pleasurable activities, low self-esteem, psychomotor retardation and other) and its comorbid illnesses together with the social, occupational and cognitive impairments significantly affect the quality of life of people with depression[14].

In the present study, there were statistically significant associations between presence of depression and overall WHOQOL-BREF score ($p<0.001$), physical domains ($p <0.001$), psychological healthy ($p <0.001$), social relation ($p <0.001$), and environment score ($p <0.001$); depressed patients exhibited lower scores in all of these domains than non-depressed patients .

Such findings confirmed that many of the breast cancer patients experience fatigue, depression, and/or anxiety months to years after their breast cancer diagnosis with these symptoms being associated with greater disability and a poorer quality of life.

There were no statistically significant associations between presence of depression and stage ($p =0.15$), and surgical procedure ($p =0.11$).

5. Conclusion

Breast cancer is often accompanied by severe psychological distress, which is associated with a significant prevalence of anxiety and depression disorders

in the course of the disease. Depression may reduce the efficacy of chemotherapy, and therefore the survival chances of cancer patients. This study provided evidence that depressive symptoms in patients with breast cancer undergoing treatments detrimentally affected various aspects of the QoL in a real-world setting.

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