



Depression and Anxiety among Females with Breast Cancer in Sohag University: Results of an Interview Study

Hanan Yousif Aly¹, Asmaa Abd ElGhany Abd ElLateef² and Ahmed El Sayed Mohamed^{2*}

¹Department of Psychiatry, Sohag Faculty of Medicine, Sohag University, Egypt

²Department of Clinical and Radiation oncology, Sohag University, Egypt

Abstract

Background: Limited research on psychiatric disorders prevalence among Upper Egyptian women treated for breast cancer. To our knowledge, no studies published earlier from our locality considering this issue.

Purpose: To explore the prevalence of anxiety and depression in a sample of women treated for breast cancer and to find possible associated factors for these disorders.

Design: A cross-sectional observational survey conducted through an interview on 96 women with breast cancer who visited the Oncology Outpatient Clinic at Sohag University from August 2016 to December 2016.

Methods: Sociodemographic and clinical data were collected for each patient; Taylor Manifest Anxiety Scale (TMAS) and Beck Depression Inventory-II used to score anxiety and depression, respectively. Questionnaires managed and responses collected.

Findings: A total of 96 women with a mean age of 49.16 years old were included in our survey. More than half (53.13%) had an advanced stage; the majority (95.83%) had breast surgery; 97.92% received systemic chemotherapy; more than half (54.17%) received breast radiation and 53.13% were omitted from hormonal treatment while 46.87% got it. Fifty-nine patients (61.46%) were disease-free and 26.04% had progressive disease on conducting the study. Nearly half of them reported depression, anxiety, or both (46.87%, 49.96% and 32.29%, respectively). One-third reported an advanced degree of depression, anxiety or both (33.34%; 33.33%, and 32.29%, respectively). As regards associations; patients with progressive/relapse disease have higher anxiety and depression with sustained statistically significant relationship in univariate and multiple regression analyses (p-value = 0.03 and 0.04, respectively); while hormonal treatment has a statistically significant positive impact on anxiety alone (p-value 0.02).

Conclusions: Our survey supports an association of breast cancer and psychiatric problems as it showed high levels of depression and anxiety among Upper Egyptian women with breast cancer attending Oncology Outpatient Clinic at Sohag University. It shows that progressive or relapsed disease is significantly associated with negative impact on both anxiety and depression while hormonal treatment has a positive impact on anxiety alone.

Keywords: Breast cancer; Anxiety; Depression

Introduction

Cancer remains the top fear in most Arab countries with most of the people fearing to mention its name [1]. This led to many social and emotional problems [2]. Arab women share the same fear, but with a set of different cultures, norms, and beliefs [3,4]. Women experience a wide range of cancer induced stress problems such as depression, anxiety, and relationship difficulties [5,6].

Breast cancer is the most frequent cancer in females worldwide [7]; in the US alone, it was expected to account for 29% of female cancers [8]. In Egypt, National sponsored programs for cancer registry is lacking, however, Egyptian NCI has been accepted as a trusted reference for population based cancer statistics. According to Egyptian NCI; breast cancer incidence increased from 18.9% [9] to reach 38.8% in 2014 [10]. Despite improvements in screening, early detection, treatment, and overall survival of breast cancer; having breast cancer represents a greater distress for females more than others diseases [8,11]. Studies have shown that the prevalence of psychological distress among

OPEN ACCESS

*Correspondence:

Ahmed El Sayed Mohamed,
Department of Clinical and Radiation
oncology, Sohag University, Faculty
of Medicine, 4 AlTaawon st, Sohag,
82519, Egypt, Tel: 01009410328;
E-mail: dr_ahmed_sayed76@yahoo.
com

Received Date: 02 Jul 2017

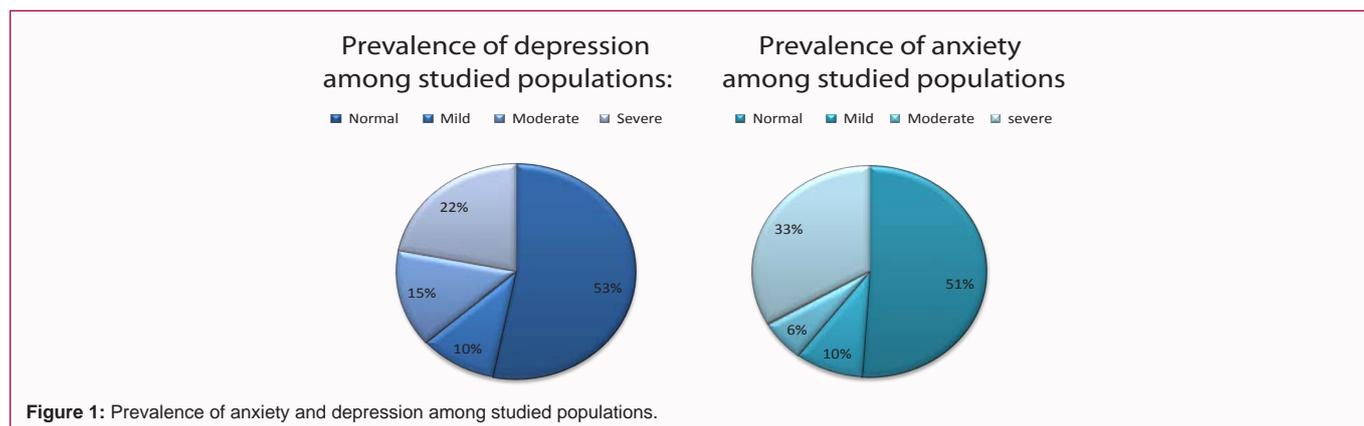
Accepted Date: 16 Aug 2017

Published Date: 21 Aug 2017

Citation:

Aly HY, Abd ElGhany Abd ElLateef A,
El Sayed Mohamed A. Depression and
Anxiety among Females with Breast
Cancer in Sohag University: Results
of an Interview Study. *Remed Open
Access.* 2017; 2: 1080.

Copyright © 2017 Ahmed El Sayed
Mohamed. This is an open access
article distributed under the Creative
Commons Attribution License, which
permits unrestricted use, distribution,
and reproduction in any medium,
provided the original work is properly
cited.



breast cancer patients is high, and they are at higher risk of developing major psychiatric comorbidities [12-16]. Depression and anxiety are the most common disorders that can be present in breast cancer patients through their illness from diagnosis to the end of the disease [17,18]. Also, Quality of Life (QOL) is impaired differently among breast cancer women through their course of diagnosis, staging, and treatments consequences [19,20]. Anxiety ranges from 10% to 30% [21]. Patients experienced anxiety symptom as a result of expecting an adverse outcome, feeling perplexed about the future, worrying toward recurrence, and troubled with treatment consequences [22]. Regardless of the high frequency of major depressive disorders among cancer patients; it often remains undetectable; this is may result from the fact that feeling depression shares the same physiological effect of cancer [23].

However, the prevalence of depression in breast cancer differs widely from as low as 1.5% - 3% to count around 50% [24]. Studies in the Western countries have shown that the prevalence of depression ranges from 1% to 56%, whereas the prevalence of depression from Asian studies is between 12.5% and 31% [25]. Arab women with breast cancer, especially those receiving little support and those with a poor body image, had a powerful psychological distress [26] with secondary negative impact on their QOL [27-29]. Depression and anxiety are considered problematic when they impair social, emotional, physical, and/or occupational functioning [30]. At the most extreme, untreated anxiety and depression predominantly affect the patients' treatment, QOL, and can result in 18% increased mortality from breast cancer and higher suicide rates [22,31]. Consequently, enhancing early recognition of mood and anxiety disorders among breast cancer patients may decrease their discomfort and raise the QOL and even well-being [24].

We conducted this study to investigate the prevalence of anxiety and depression and to examine the demographic, oncologic, and psychosocial associations to determine possible risk factors for having these disorders among breast cancer women attending our center.

Patients and Methods

Design

This is a cross-sectional observational study of 96 women with breast cancer diagnosis.

Population

Patients with breast cancer-attended the Oncology Outpatient Clinic at Sohag University - were consecutively seen from August 2016 to December 2016. The inclusion criteria were: (i) women with 18

years or older (ii) histologically confirmed breast cancer (iii) physical and mental ability to answer/complete required questionnaires (iv) patients who were receiving active oncology treatment or undergoing evaluation for treatment complications, having new symptoms, and seeking for follow up according to standard surveillance protocols. The purpose and details of the study were explained to all potential subjects. Those with a history of psychiatric disorder and/or had metastatic brain disease were all excluded from the study. The study was discussed; an approval to complete the survey deemed to be an agreement of consent. Ethical approval was obtained from the appropriate institutional ethical review committees.

Methods and instruments

Questionnaires were presented to patients and subjects were asked to complete questionnaires through an interview. Patients were seen in the Oncology Outpatient Clinic at Sohag University during the study period. Anxiety and depression were assessed using Taylor Manifest Anxiety Scale (TMAS) and Beck Depression Inventory-II respectively. Beck Depression Inventory-II [32] is a widely used 21-item self-report questionnaire that was designed to measure the presence and severity of depressive symptoms. The scale measures various components of the depressive experience; the affective, cognitive, somatic, and motivational aspects of the disorder. Each item in the BDI consists of 4 possible responses on a 4-point Likert scale ranging from 0-3.

TMAS [33] is used as a general indicator of anxiety as a personality trait. It is not intended as a specific measure of anxiety as a clinical entity. This early instrument is derived from MMPI and is presented in a long version (50 items) and a short one (28 items). In this study, we used an Arabic translation of the long version of the scale. True and false responses are used for each item.

We calculated the point prevalence as the percentage of women with depression, anxiety, or both at the time of interview. Responses to these scales were registered and calculation of scores was as follows:

Beck depression inventory-II: The total score on this instrument ranges from 0-63. Responses were classified as follows: 0-13 considered normal; 14-19 mild depression; 20-28 moderate depression; 29-63 severe depression. We use the Arabic version [34].

Taylor manifest anxiety scale (TMAS): Responses were counted; a score from 0 to 50 was given. Interpretation was as follows: zero-16: normal; 17-24: mild; 25-35: moderate; 36-50: severe [35]. Sociodemographic and clinical data obtained, collected, and analyzed using patient's medical reports after having a patient's agreement (Table 1).

Table 1: Characteristics of study population.

Age	
Mean ± SD	49.16±12.79
Median (range)	49 (27-82)
Marital status	
Single	6 (6.25%)
Married	61 (63.54%)
Divorced	4 (4.17%)
Widow	25 (26.04%)
Menopausal status	
Premenopausal	44 (45.83%)
Perimenopausal	3 (3.13%)
Postmenopausal	49 (51.04%)
Educational level	
Low	75 (78.95%)
Middle	18 (18.95%)
High	2 (2.11%)
Surgery	
No	4 (4.17%)
Biopsy	5 (5.21%)
Conservative surgery	15 (15.63%)
MRM	72 (75.00%)
Stage	
Early	45 (46.88%)
Advanced	51 (53.13%)
M	
Mo	76 (79.17%)
M1	20 (20.83%)
Duration of the disease	
Mean ± SD	37.84±27.92
Median (range)	27.43 (6.07-146.1)
>2 years duration	59 (61.45 %)
< 2 years duration	37 (38.55 %)
Estrogen receptors	
Negative	37 (38.54%)
Positive	59 (61.46%)
Chemotherapy	
No	2 (2.08%)
Yes	94 (97.92%)
Radiotherapy	
No	42 (43.75%)
Bone	2 (2.08%)
Breast	52 (54.17%)
Hormonal therapy	
No	51 (53.13%)
Yes	45 (46.88%)
Assessment	
Free	59 (61.46%)

Progressive	25 (26.04%)
Regressive	5 (5.21%)
Relapse	1 (1.04%)
Stationary	6 (6.25%)
Status on survey	
Follow up	22 (22.92%)
Chemotherapy	32 (33.33%)
Hormonal	37 (38.54%)
Radiotherapy	5 (5.21%)

Table 2: Prevalence of anxiety and depression among studied populations.

Variable	Summary statistics
Depression	
Normal	51 (53.13%)
Mild mood disturbance	10 (10.42%)
Borderline clinical depression	3 (3.13%)
Moderate depression	11 (11.46%)
Severe depression	11 (11.46%)
Extreme depression	10 (10.42%)
Anxiety	
Normal	49 (51.04%)
Mild	9 (9.38%)
Moderate	6 (6.25%)
Severe	2 (2.08%)
Very severe	30 (31.25%)
Both (moderate to severe)	31(32.29 %)

Statistical analysis

Data analyzed using STATA intercooled version 12.1. Quantitative data represented as mean, standard deviation, median, and range. Data analyzed using Student t-test to compare means of two groups. When data not normally distributed Kruskal-Wallis test for comparison of three or more groups and Mann-Whitney test was used to compare two groups. Qualitative data presented as number and percentage and compared using either Chi-square test or Fisher exact test. Multiple logistic regression performed for factors with a p-value <0.10 in univariate analysis to determine factors associated with anxiety and depression. Graphs produced using Excel or STATA program. P value was considered significant if it was less than 0.05.

Results

Subjects

Over our study period; a total of 96 women with breast cancer agreed to be included. These women were seen at the oncology outpatient clinic and completed the study questionnaires. The mean age of them is 49.16 years old (standard deviation = 12.79) with a median age of 49 years old (range: 27-82). Sixty-one women (63.54%) were married and 64 (66.67%) with high parity status. Nearly half (49%) were postmenopausal and 75% were of low educational level (Table1).

Breast cancer-related data

More than half (53.13%) had an advanced stage with one-fifth of cases (20.83%) were metastatic. The majority (95.83%) had a breast

Table 3: Univariate analysis of factors associated with anxiety and depression.

Variables	No anxiety N=49	Anxiety N=47	P value	No depression N=51	Depression N=45	P value
Age						
Mean ± SD	50.94±12.90	47.30±12.55	0.16	49.12±12.07	49.2±13.70	0.98
Median (range)	50 (30-79)	46 (27-82)		49 (30-75)	49 (27-82)	
Menopausal status						
Premenopausal	20 (40.82%)	24 (51.06%)	0.56	23 (45.10%)	21 (46.67%)	0.89
Perimenopausal	2 (4.08%)	1 (2.13%)		2 (3.92%)	1 (2.22%)	
Postmenopausal	27 (55.10%)	22 (46.81%)		26 (50.98%)	23 (51.11%)	
Marital status						
Single	1 (2.04%)	5 (10.64%)	0.19	1 (1.96%)	5 (11.11%)	0.17
Married	32 (65.31%)	29 (61.70%)		35 (68.63%)	26 (57.78%)	
Divorced	1 (2.04%)	3 (6.38%)		1 (1.96%)	3 (6.67%)	
Widow	15 (30.61%)	10 (21.28%)		14 (27.45%)	11 (24.44%)	
Educational level						
Low	40 (83.33%)	35 (74.47%)	0.12	40 (80.00%)	35 (77.78%)	0.32
Middle	6 (12.50%)	12 (25.53%)		8 (16.00%)	10 (22.22%)	
High	2 (4.17%)	0		2 (4.00%)	0	
Surgery						
No	2 (4.08%)	2 (4.26%)	0.81	1 (1.96%)	3 (6.67%)	0.39
Biopsy	3 (6.12%)	2 (4.26%)		4 (7.84%)	1 (2.22%)	
Conservative surgery	6 (12.24%)	9 (19.15%)		7 (13.73%)	8 (17.78%)	
MRM	38 (77.55%)	34 (72.34%)		39 (76.47%)	33 (73.33%)	
Stage						
Early	25 (51.02%)	20 (42.55%)	0.41	26 (50.98%)	19 (42.22%)	0.39
Advanced	24 (48.98%)	27 (57.45%)		25 (49.02%)	26 (57.78%)	
Duration of the disease						
Mean ± SD	40.04±28.64	35.54±27.28	0.52	39.76±28.93	35.65±26.90	0.70
Median (range)	27.43 (7.1-113.7)	27.43 (6.07-146.1)		26.4 (6.07-113.7)	28.43 (10.16-146.1)	
M						
Mo	41 (83.67%)	35 (74.47%)	0.27	44 (86.27%)	32 (71.11%)	0.07
M1	8 (16.33%)	12 (25.53%)		7 (13.73%)	13 (28.89%)	
Chemotherapy						
No	2 (4.08%)	0	0.50	1 (1.96%)	1 (2.22%)	1.00
Yes	47 (95.92%)	47 (100%)		50 (98.04%)	44 (97.78%)	
Radiotherapy						
No	19 (38.78%)	23 (48.94%)	0.27	21 (41.18%)	21 (46.67%)	0.85
Bone	2 (4.08%)	0		1 (1.96%)	1 (2.22%)	
Breast	28 (57.14%)	24 (51.06%)		29 (56.86%)	23 (51.11%)	
Hormonal therapy						
No	19 (38.78%)	32 (68.09%)	0.005	23 (45.10%)	28 (62.22%)	0.09
Yes	30 (61.22%)	15 (31.91%)		28 (54.90%)	17 (37.78%)	
Assessment						
Free	36 (73.47%)	23 (48.94%)	0.02	38 (74.51%)	21 (46.67%)	0.01
Progressive/relapse	7 (14.29%)	19 (40.43%)		8 (15.69%)	18 (40.00%)	
Regressive/Stationary	6 (12.24%)	5 (10.64%)		5 (9.80%)	6 (13.33%)	

surgical procedure ranges from biopsy (5.21%) to total mastectomy (75%) and almost all (97.92%) received systemic chemotherapy. More than half (54.17%) received breast radiation and 53.13% were omitted from hormonal treatment while 46.87% had it. Fifty-nine patients (61.46%) were disease-free and 25 (26.04%) had progressive disease. More than two-thirds (71.87%) still receiving systemic treatment at the time of this survey (Table 1).

Prevalence of depression and anxiety

The prevalence of depression, anxiety, or both (including borderline cases) is 46.87%, 49.96%, and 32.29%, respectively (Figure 1). Advanced degree of depression is 33.34% of cases, while anxiety is advanced in about one-third of them (33.33%). Both psychological disturbances were manifested as an advanced form (moderate and severe degrees) in almost one-third of cases, especially advanced breast cancer women (32.29%) (Table 2).

Risk factors for depression and anxiety

Table 3 summarizes the results of logistic regression analyses. Progressive and/or relapsed disease and hormonal treatment were the only factors that showed statistically significant association with anxiety (p-value = 0.02 and 0.005, respectively). As regards depression; only progressive and/or relapsed disease showed a significant association (p-value = 0.01). A trend for association with

depression was seen in women with metastases and those receiving hormonal treatment (p-value = 0.09 and 0.07, respectively). These parameters were included in the multivariate model (Table 4); among them, only progressive and/or relapsed disease sustained a statistically significant relationship with both anxiety and depression (p-value = 0.03 and 0.04, respectively); women who progressed or relapsed are more likely to have anxiety and/or depression (AOR = 3.29 and 3.21, respectively). Hormonal treatment held a statistically significant association for anxiety alone (p-value 0.02) as women receiving any type of hormonal treatment are less likely to develop anxiety by two-thirds (AOR 0.31).

Discussion

There is no much data on the prevalence of these psychiatric disorders in women with breast cancer in our locality so, we conducted this observational study to explore the prevalence and risk factors for depression and anxiety among samples of breast cancer women attending our Outpatient Clinic at Sohag University Hospital. This survey showed that the prevalence of depression, anxiety, or both (including borderline cases) is 46.87%, 49.96%, and 32.29%, respectively. Among depression group; distribution seems to be shifted towards an advanced degree (33.34%). Also, among anxiety group; advanced degree represents one-third of cases (33.33%). Both

Table 4: Multivariate logistic regression of factors associated with anxiety (includes factors with p<0.10).

Factors	Adjusted odds ratio (95% confidence interval)	P value
Hormonal therapy		
No	1	0.02
Yes	0.31 (0.13-0.80)	
Assessme		
Free	1	0.03
Progressive/relapse	3.29 (1.14-9.45)	
Regressive/Stationary	0.73 (0.18-2.96)	
Multivariate logistic regression of factors associated with depression (includes factors with p<0.10)		
M		
Mo	1	0.54
M1	1.51 (0.40-5.64)	
Hormonal therapy		
Nos	1	0.4
Yes	0.68 (0.27-1.67)	
Assessment		
Free	1	0.04
Progressive/relapse	3.21 (1.07-9.5)	
Regressive/Stationary	1.34 (0.26-6.91)	

psychological disturbances were represented as an advanced degree among 32.29% of women. Both disorders are negatively related to progressive and/or relapsed disease in the univariate logistic regression analysis (p-value = 0.02 and 0.01 for anxiety, depression, respectively). This effect persists in the multivariate model as well (p-value = 0.03 and 0.04 for anxiety, depression respectively). On the other hand; hormonal treatment showed a strong positive impact on anxiety in the univariate and multiple regression analyses (p-value = 0.005 and 0.02, respectively). Women receiving hormonal treatment are less likely to have anxiety than those who do not (Table 3 and 4).

These results pointed to the high level of depression and anxiety among our breast cancer patients with a severe form of each disorder or both. Our findings are in line with several studies that showed a psychological dysfunction rate ranging from 30% to 47% or even more. Kissane et al. [36] found that 45% of the patients had various psychiatric disorders, 42% of whom had depression and anxiety. Fahmy et al. [37] reported that 40% of their samples were suffering from adjustment disorder, anxiety, and depression. Also, a large study reported that the prevalence of depression among breast cancer survivors was about 32.8% [38]. According to another one; it was specified that 40% of breast cancer women experienced a high level of anxiety or depression [39].

This was documented in another study [14] which reported that the depression rate was highest (48%) in the first year following initial diagnosis; also, Vahdadina et al. [40] showed that anxiety and depression rates were calculated as 38.4% and 32.3%, respectively, even after 1.5 years from diagnosis. A study by Dastan and Buzlu [41] reported that 35% of their breast cancer patients had anxiety, while El Missiry et al. [24] disclosed that the psychiatric morbidity rate was 54.7% and 76% for the early postoperative cases and recurrent cases, respectively. Srivastava et al. [7] estimated the prevalence of depression and anxiety among cancer patients to be 37.0% and 28.0%, respectively.

Also, our findings are matched with a study conducted by Hassan

et al. [2] who reported that the prevalence of anxiety and depression was 31.7% and 22.0%, respectively. Ng CG et al. [22] showed a high level of distress associated with breast cancer manifested as a high prevalence of anxiety and depression.

This study reported an advanced degree of depression (moderate to very severe 33.34%), anxiety (33.33%) or both (32.29%); this is consistent with Vahdaninia et al. [40] who found that 38.4% of the patients experienced severe anxiety and 22.2% had severe depression. Also, Hassan et al. [2] revealed that breast cancer patients have a high degree of depression and anxiety (25.9% and 25.6%, respectively). Elsheshtawy et al. [42] estimated that about 70% of patients suffered from depression of mild to moderate severity, none had severe depression, and as regards anxiety; about 73% were anxious.

In our survey, the most prevalent degree of depression and anxiety is of severe form. This was unlike Elsheshtawy et al. [42] who reported that the high prevalence is of mild to moderate anxiety, as only 2% of cases had severe anxiety and none had severe depression. Also, our findings not in line with El Missiry et al. [24] who showed that most of the cases have mild to moderate disorders. This difference could be due to cultural differences between the geographical distributions of patients, as in Upper Egypt, most female patients lack social support unlike Lower Egypt women; also, the high cost of psychiatric service there.

In the current study, anxiety and depression were shown to be negatively correlated with the progression and/or relapse of breast cancer as shown in univariate analysis (Table 3) and multiple regression analysis (Table 4). This may be due to its negative impact on prognosis, survival, and due to continued treatment (chemotherapy, radiotherapy or others) that affects the QOL for these women. These findings are supported by studies conducted through the Arab world [43-45] and in Egypt; Mostafa et al. [28] revealed a significant strong relationship between QOL and disease stage/presence of secondaries among Egyptian patients.

Unlike studies that suggest a negative impact on women QOL who received hormonal treatment [46-48], our survey shows a positive impact of receiving hormonal treatment. This may be explained as even in advanced cases, hormonal treatment has lower side effects than chemotherapy hence psychological disorders are less evident [49].

While the advanced disease is often considered as a risk factor for increased vulnerability to depression and anxiety [50,51]; our study did not show such association as there is no difference between patients with the early or advanced disease in having depression and/or anxiety (p value = 0.39 and 0.41, respectively). This finding is in line with an Australian study [52] which showed an equivalent rate of psychiatric morbidity among different disease stages and suggested that the stress of the diagnosis was more relevant than the disease stage.

Also, another study [52] conducted on breast cancer patients showed no significant difference among patients with early or advanced disease as regards psychological distress with a prevalence of 45.3% and 37% for both groups, respectively. However, if we considered the remote metastases status in our study; depression showed more prevalence in metastatic women with a trend for statistical significance (p-value 0.07) (Table 3).

Limitations

Our findings should be interpreted with caution as there are a few factors that may limit extrapolation of these results to the general population of women with breast cancer. These factors include small sample size, a potential for selection bias as patients included may be more likely to give a perceived severity of their illness and about 72 % of responders were surveyed while receiving active cancer treatment. More than 60 % of patients recruited in our survey had a disease with more than 2 years duration and this may reflect a prolonged experience of treatment toxicities, recurrence, and metastatic disease negative impact, however, this was not statistically significant (Table 3).

Also, more than 75 % of women were not educated; our survey conducted in a tertiary hospital and the observational period may be insufficient to express the actual magnitude of the problem. Lastly, QOL was not assessed in our survey, which is a major issue in relation to reported psychological disorder.

Conclusions

Our survey shows that breast cancer women attending our hospital have relatively high level of depression and anxiety. It shows that progressive or relapsed disease is significantly associated both anxiety and depression while hormonal treatment has a positive impact on anxiety alone. For managing breast cancer patients, more care or support should be given to this type of patients as they are at high risk of anxiety and depression.

Recommendations

These findings reflect the importance of exploring psychiatric disorders in larger cohorts than the current survey samples. This will help to improve the caregiver system for breast cancer women and to enhance the social support for these women. Future research should explore giving psychiatric treatment and/or interventions in a larger sample size to assist Egyptian women with breast cancer, aiming to reduce depression and anxiety symptom distress and enhance coping

strategies among them.

References

1. El Saghir NS, Khalil MK, Eid T, El Kinge AR, Charafeddine M, Geara F, et al. Trends in epidemiology and management of breast cancer in developing Arab countries: a literature and registry analysis. *Int J Surg.* 2007; 5: 225-233.
2. Hassan MR, Shah SA, Ghazi HF, Mujar NMM, Samsuri MF, et al. Anxiety and Depression among Breast Cancer Patients in an Urban Setting in Malaysia. *Asian Pac J Cancer Prev.* 2015; 16:4031-4035.
3. Bates MS, Rankin-Hill L, Sanchez-Ayendez M. The effects of the cultural context of health care on treatment of and response to chronic pain and illness. *Soc Sci Med.* 1997; 45: 1433-1447.
4. Taleghani F, Yekta ZP, Nasrabadi AN. Coping with breast cancer in newly diagnosed Iranian women. *J Adv Nurs.* 2006; 54: 265-272.
5. Maass SWMC, Roorda C, Berendsen AJ, Verhaak PFM, de Bock GH. The prevalence of long-term symptoms of depression and anxiety after breast cancer treatment: A systematic review. *Maturitas.* 2015; 82: 100-108.
6. Cvetković J, Nenadović M. Depression in breast cancer patients. *Psychiatry Res.* 2016; 240: 343-347.
7. Srivastava V, Ansari MA, Kumar A, Shah AG, Rakesh Kumar Meena, Prasant Sevach, et al. Study of Anxiety and Depression among Breast Cancer Patients from North India. *Clin Psych.* 2016; 2: 4.
8. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2016. *CA Cancer J Clin.* 2016; 66: 7-30.
9. El-Hadidy MA, Elnahas W, Hegazy MAF, Hafez MT. Psychiatric morbidity among Egyptian breast cancer patients and their partners and its impact on surgical decision-making. *Breast Cancer: Targets and Therapy.* 2012; 4: 25-32.
10. Ibrahim AS, Khaled HM, Mikhail NN, Baraka H, Kamel H. Cancer incidence in egypt: results of the national population-based cancer registry program. *J Cancer Epidemiol.* 2014; 2014: 437971.
11. Shapiro SL, Lopez AM, Schwartz GE, Bootzin R, Figueredo AJ, Braden CJ, et al. Quality of life and breast cancer: relationship to psychosocial variables. *J Clin Psychol.* 2001; 57: 501-19.
12. Mehnert A, Koch U. Psychological co-morbidity and health-related quality of life and its association with awareness, utilization and need for psychosocial support in a cancer register based sample of long-term breast cancer survivors. *J Psychosom Res.* 2008; 64: 383-391.
13. Deshields T, Tibbs T, Fan MY, Taylor M. Differences in patterns of depression after treatment for breast cancer. *Psychooncology.* 2006; 15: 398-406.
14. Burgess C, Cornelius V, Love S, Graham J, Richards M, Ramirez A. Depression and anxiety in women with early breast cancer: five year observational cohort study. *BMJ.* 2005; 330: 702.
15. Reich M, Lesur A, Perdrizet-Chevallier C. Depression, quality of life and breast cancer: a review of the literature. *Breast Cancer Res Treat.* 2008; 110: 9-17.
16. Lueboonthavatchai P. Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. *J Med Assoc Thai.* 2007; 90: 2164-2174.
17. Härter M, Reuter K, Aschenbrenner A, Schretzmann B, Marschner N, Hasenburger A, et al. Psychiatric disorders and associated factors in cancer: results of an interview study with patients in inpatient, rehabilitation and outpatient treatment. *Eur J Cancer.* 2001; 37: 1385-1393.
18. Baumeister H, Kriston L, Bengel J, Härter M. High agreement of self-report and physician-diagnosed somatic conditions yields limited bias in examining mental/physical comorbidity. *J Clin Epidemiol.* 2010; 63: 558-565.

19. Montazeri A, Vahdaninia M, Harirchi I, Ebrahimi M, Khaleghi F, Jarvandi S. Quality of life in patients with breast cancer before and after diagnosis: an eighteen months follow-up study. *BMC Cancer*. 2008; 8: 330.
20. Hopwood P, Haviland JS, Sumo G, Mills J, Bliss JM, Yarnold JR. Comparison of patient-reported breast, arm, and shoulder symptoms and body image after radiotherapy for early breast cancer: 5-year follow-up in the randomised Standardisation of Breast Radiotherapy (START) trials. *Lancet Oncol*. 2010; 11: 231-240.
21. Stark DP, House A. Anxiety in cancer patients. *Br J Cancer*. 2000; 83: 1261-1267.
22. Ng CG, Mohamed S, Kaur K, Sulaiman AH, Zainal NZ, Taib NA, MyBCC Study group. Perceived distress and its association with depression and anxiety in breast cancer patients. *PLoS One*. 2017; 12: e0172975.
23. Pasquini M, Biondi M, Costantini A, Cairolì F, Ferrarese G, Picardi A, Sternberg C. Detection and treatment of depressive and anxiety disorders among cancer patients: feasibility and preliminary findings from a liaison service in an oncology division. *Depress Anxiety*. 2006; 23: 441-448.
24. El Missiry A, Abdel Meguid M, El Missiry M, El Serafi D. Psychiatric morbidity and pattern of coping among a sample of Egyptian women in early versus recurrent stage of breast cancer. *The Arab Journal of Psychiatry*. 2011; 22: 36-44.
25. Zainal NZ, Nik-Jaafar NR, Baharudin A, Sabki ZA, Ng CG. Prevalence of depression in breast cancer survivors: a systematic review of observational studies. *Asian Pac J Cancer Prev*. 2013; 14: 2649-2656.
26. Cohen M, Mabjish AA, Zidan J. Comparison of Arab breast cancer survivors and healthy controls for spousal relationship, body image, and emotional distress. *Qual Life Res*. 2011; 20: 191-198.
27. El Sharkawi FM, Sakr MF, Atta HY, Ghanem HM. Effect of different modalities of treatment on the quality of life of breast cancer patients in Egypt. *La Revue de Santé de la Méditerranée orientale*. 1997; 3: 68-81.
28. Mostafa ESM, Sadek RR, El-Sherif MA, Saber RA, Mosalem FA. Assessment of quality of life for female breast cancer patients attending el-minia oncology center from June to December 2009. *El-Minia Med Bul*. 2010; 21: 161-170.
29. Denewer A, Farouk O, Kotb S, Setit A, Abd Elkhalek S, Shetiwy M. Quality of life among Egyptian women with breast cancer after sparing mastectomy and immediate autologous breast reconstruction: a comparative study. *Breast Cancer Res Treat*. 2012; 133: 537-544.
30. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5 ed. Washington DC: American Psychiatric Association; 2013.
31. Pinquart M, Duberstein PR. Depression and cancer mortality: a meta-analysis. *Psychol Med*. 2010; 40: 1797-1810.
32. Beck AT, Steer RA. *Manual for the Beck Depression Inventory*. San Antonio, TX: Psychological Corporation; 1993.
33. TAYLOR JA. A personality scale of manifest anxiety. *J Abnorm Psychol*. 1953; 48: 285-290.
34. Abdel-Khalek AM. Internal consistency of an Arabic Adaptation of the Beck Depression Inventory in four Arab countries. *Psychol Rep*. 1998; 82: 264-266.
35. Fahmi M, Ghali M, Meleka K. Arabic version of the personality scale of manifest anxiety. *Egyptian Psychiatry*. 1997; 11:119- 126.
36. Kissane DW, Clark DM, Kin J, Bloch S, Smith GC, Vitetta L, McKenzie DP. Psychological morbidity and quality of life in Australian women with early-stage breast cancer; a cross section survey. *Med J Aust*. 1998; 17: 1192-1196.
37. Fahmy M, Abdel Mohsen S and Al Sheekh E. The psychological sequel of breast cancer and their relationships to locus of control, fatigue, coping styles and treatment. *Current Psychiatry*. 2000; 7: 39-53.
38. Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. *Psychooncology*. 2001; 10: 19-28.
39. Gallagher J, Parle M, Cairns D. Appraisal and psychological distress six months after diagnosis of breast cancer. *Br J Health Psychol*. 2002; 7: 365-376.
40. Vahdaninia M, Omidvari S, Montazeri A. What do predict anxiety and depression in breast cancer patients? A follow-up study. *Soc Psychiatry Psychiatr Epidemiol*. 2010; 45: 355-361.
41. Dastan NB, Buzlu S. Depression and anxiety levels in early stage Turkish breast cancer patients and related factors. *Asian Pacific J Cancer Prev*. 2011; 12: 137-41.
42. Elsheshtawy EA, Abo-Elez WF, Ashour HS, Farouk O, El Zaafarany MI. Coping strategies in egyptian ladies with breast cancer. *Breast Cancer (Auckl)*. 2014; 8: 97-102.
43. Awad MA, Denic S, El Taji H. Validation of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaires for Arabic-speaking Populations. *Ann N Y Acad Sci*. 2008; 1138: 146-154.
44. Alawadi SA, Ohaeri JU. Health - related quality of life of Kuwaiti women with breast cancer: a comparative study using the EORTC Quality of Life Questionnaire. *BMC Cancer*. 2009; 9: 222.
45. Masmoudi A, Frikha M, Daoud J. Feasibility of quality of life assessment in routine clinical oncology practice: a Tunisian study. *East Mediterr Health J*. 2009; 15: 362-368.
46. Ganz PA. Impact of tamoxifen adjuvant therapy on symptoms, functioning, and quality of life. *J Natl Cancer Inst Monogr*. 2001; 30: 130-134.
47. Fallowfield L, Cella D, Cuzick J, Francis S, Locker G, Howell A. Quality of life of postmenopausal women in the Arimedex, Tamoxifen, Alone or in Combination (ATAC) adjuvant breast cancer trial. *J Clin Oncol* 2004; 22: 4261-4271.
48. Harwood KV. Advances in endocrine therapy for breast cancer: considering efficacy, safety, and quality of life. *Clin J Oncol Nurs*. 2004; 8: 629-637.
49. Yang H, Brand JS, Fang F, Chiesa F, Anna LVJ, Per H, kamila C. Time-dependent risk of depression, anxiety, and stress-related disorders in patients with invasive and in situ breast cancer. *Int J Cancer*. 2017; 140: 841-852.
50. Turner J, Zapart S, Pedersen K, Rankin N, Luxford K, Fletcher J; National Breast Cancer Centre, et al. Clinical practice guidelines for the psychosocial care of adults with cancer. *Psychooncology*. 2005; 14: 159-73.
51. Li M, Fitzgerald P, Rodin G. Evidence-based treatment of depression in patients with cancer. *J Clin Oncol*. 2012; 30: 1187-1196.
52. Kissane DW, Grabsch B, Love A, Clarke DM, Bloch S, Smith GC. Psychiatric disorder in women with early stage and advanced breast cancer: a comparative analysis. *Aust N Z J Psychiatry*. 2004; 38: 320-326.