ORIGINAL ARTICLE

Poor Subjective Sleep Quality; A Clinical Correlate to Depression and Quality of Life Among Breast Cancer Patients

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Background	Breast cancer patients are vulnerable to depression with prevalence varying in literature with direct and indirect impact on compliance to treatment, quality of life and response to therapeutic course. Our study aims at identifying poor sleep quality as clinical marker for depression and poor quality of life among breast cancer patients.
Patients and Methods	100 female patients with breast cancer diagnosis were recruited from Alexandria Police Hospital after consenting they were subject to Hamilton Rating Scale (HAM-D), Ferrans and Powers Quality of Life Scale (QOL), Pittsburg sleep quality Index (PSQI) and structured demographic data questionnaire was done to collect relevant data.
Results	The prevalence of moderate to severe depressive symptoms on HAM-D was 52%, PSQI mean score 9.98±4.4, QOL mean score 14.2±2.4, high significant association has been found between poor sleep quality and both intensity of depression and quality of life (p <0.001). Poor sleep quality was positively correlated to depression (r= 0,79; p <0.001) and negatively correlated to quality of life (r= -0.65; p <0.001).
Conclusions	Poor sleep is underestimated among breast cancer patients and should raise awareness for pathological depression and poor quality of life.
Keywords	Breast cancer, Depression, Hamilton Rating Scale for depression, Insomnia, Pittsburg Sleep Quality Index, Quality of life.
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INTRODUCTION

Breast cancer patients show higher prevalence of depression throughout all stages of the illness, from appearance of first symptoms, time of diagnosis, during treatment and palliative care (Mausbach *et al.,* 2015). An important challenge to clinicians is to identify the point when normal sadness related to cancer turns pathological with depressive disorders and subsequent affects therapeutic compliance and outcome (Mausbach *et al.,* 2015). Depression is often underestimated in breast cancer with prevalence varying between 10 and 86%, Although depression has been found to be the highest at diagnosis, depression during survivorship has not been adequately studied (Boehm *et al.,* 2014; Stagl *et al.,* 2015a, 2015b).

The study of depressive symptoms among patients with breast cancer has been under focus within the scientific community. It's evident that depression has negative influence on disease course, treatment response, compliance to pharmacotherapy, quality of life (QOL), and overall mortality rate when other covariants are adjusted for statistical purposes (Boyle *et al.,* 2017). Similar findings are found in patients with diagnosis of Major depressive disorder before diagnosing their cancer breast. Such consistent findings encouraged many authors to recommend therapeutic approach to depressive symptoms weather antidepressant medications or psychological

interventions such as meditation and cognitive therapy (Liang *et al.,* 2017).

In terms of cost effectiveness, women with breast cancer have higher costs directly related to therapy. Such finding was even tested for racial differences and revealed no difference. Although prevalence of breast cancer tended to be higher among white women compared with black women, the prevalence of depression among both races was similar, with nearly similar increased therapy costs compared with those women with breast cancer who do not fulfill criteria for major depression (Husaini *et al.,* 2017).

AIM PF THE STUDY

Our study aims at assessing poor sleep as marker for depression and poor QOL among patients with breast cancer.

SUBJECTS AND METHODS

This is a cross-sectional observational study where 100 adult female patients with breast cancer consulting outpatient oncology clinic at Alexandria Police Hospital were recruited after explanation of the study's study's purpose and obtaining written consent. No age restriction was imposed. Patients having chronic debilitating medical illness, hypothyroidism, or taking tamoxifen were excluded. Structured Demographic data questionnaire was applied to participants. They also underwent blood picture, renal function, and hepatic function tests. Hamilton Rating Scale for depression (HAM-D) was performed to screen for depressive symptoms, Ferrans and Powers QOL Index was used to quantitatively ass QOL, and lastly sleep was assessed by Pittsburg Sleep Quality Index (PSQI).

Psychometric Assessment

1. HAM-D: is a multiple-item questionnaire used to provide an indication of depression and a guide to evaluate progress and recovery. The questionnaire is designed for adults and is used to rate severity of depression by probing mood, feeling of guilt, suicide ideation, insomnia, agitation or retardation, anxiety, weight loss, and somatic symptoms. Initially, it was considered the golden standard for rating depression in clinical research. The original 1960 version contains 17 items to be rated, but four other questions are not added to the total score and used to provide additional clinical information. Each item on the questionnaire is scored on a three-point or five-point scale, depending on item, and total score is calculated. Assessment time estimated at 20min. Scores from 0–7 are considered normal, and scores of 20 or higher indicate moderate to severe depression and are often required for entry into clinical trial (Hedlund and Viewig, 1979).

2. Ferrans and Powers QOL index: it assesses subjective perception of the level of happiness and satisfaction toward the different aspects of life and is one of the major determinants of positive judgment of the subjectively perceive positive judgment of the subjectively perceived QOL. Happiness and satisfaction are relative values. Although happiness is a temporary emotional experience, satisfaction reflects a cognitive rather than emotional experience with prolonged stable judgment about one's life experiences. Satisfaction is central to assess QOL construct. The current ferrans and Powers QOL index has 33 items where subjects attribute scores in a satisfaction and importance scale, with values ranging from 1 to 6. Score ranges from very unsatisfied to very satisfied. The 33 items are distributed into four dimensions or subscales: health (13 items), socioeconomic (8 items), psychological and spiritual (7 items) and familial issues (5 items) (Ferrans and Powers, 1985; Oleson, 1990; Ferrans, 1996).

3. PSQI: it is a self-reporting questionnaire to assess sleep quality over a period of one month. It consists of 19 items generating seven component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. It is considered a standardized sleep questionnaire for clinicians and researchers. The questionnaire consists of 19 items each scored from 0 to 3. A global score is calculated with lower scores indicating better sleep quality whereas higher scores indicating poor sleep quality (Buysse *et al.,* 1989; Grandner *et al.,* 2006).

Statistical Analysis

The collected data were fed into computer after coding using Statistical Package for Social Sciences, version 11.5 for data analysis and tabulation. Descriptive analysis was done. Parametric values such as arithmetic mean, median, and SD were calculated. c^2 test was used as a nonparametric testing tool. Type one statistical errorwas set at less than 0.05.

RESULTS

Descriptive statistics

Age ranged from 21 to 74 years, with a mean of 47.32±13.37 years. Overall, 58% were menopausal. As for marital status, single, married, widowed, and divorced represented 12, 72, 14, and 2%, respectively. Overall, 66% of our sample had a positive family history for breast cancer, 18% had positive family history for psychiatric illness, and 8% had positive family history for depression.

Regarding staging, 2, 42, 46, and 10% were those having stages I, II, III, and IV, respectively. Overall, 18% were receiving chemotherapy, 6% had brain metastasis on scanner radiology, and 18% had lumpectomy versus 36% had modified radical mastectomy.

Histopathological subtyping of tumor was 20% fibroadenomatous dysplasia and 80% infiltrative ductal carcinoma.

According to HAM-D to assess severity of depressive symptoms, 32%, 34% and 20% had mild, moderate and severe depressive symptoms, respectively. The mean total score for HAM-D was 14±4.99, for PSQI was 9.98±4.41, and for Ferrans and Powers QOL Index was 14.2±2.41.

Inferential statistics

No significant association could be found between poor sleep quality and menopausal state, marital state,

presence of brain metastasis, preoperative use of adjuvant chemotherapy, or advanced tumor stage (P >0.05) (Table 1).

Correlation study

Our study revealed strong positive correlation with depressive manifestations and a strong negative correlation with QOL, as shown in Table 2.

Table 1: Poor sleep quality was associated with higher intensity of depression as well as poor quality of life:

| Psychometric Scale | Pittsburg Sleep Quality Index PSQI (*N*=100) | | | | Statistical test |
| | Good sleep (*N*=22) | | Poor sleep (*N*=78) | | |
	No.	%	No.	%	
Hamilton Rating Scale for Depression					
Normal	8	36.4	6	7.7	χ^2=11.72*
Depressive manifestations	14	63.6	72	92.3	
HAM-D in terms of severity					
Normal	8	36.4	6	7.7	
Mild depression	8	36.4	24	30.8	
Moderate depression	6	27.3	28	35.9	χ^2=15.87*
Severe depression	0	0	20	25.6	
Quality of Life Index					
Range (Min-Max)	12.24 - 22.64		11.2 - 16.68		t=3.41*
Mean±SD	16.28±3.58		13.61±1.54		

HAM-D: Hamilton Rating Scale for depression; *: *P* value less than 0.05.

Table 2: Hamiliton Rating Scale for Depression and Quality of Life Index:

| Psychometric Scale | Pittsburg Sleep Quality Index PSQI | |
	Correlation Coefficient	Level of Significance
Hamilton Rating Scale for Depression HAM-D	+0.789*	*P* <0.001
Ferrans and Powers Quality of life Index QOL	-0.645*	*P* <0.001

P value less than 0.05.

DISCUSSION

Patients with cancer are vulnerable to psychological morbidities for a variety of reasons like metabolic or endocrine alterations, treatment with debilitating chemotherapy, immune response modifiers, and chronic pain associated with cancer (Ballenger et al., 2001). Moreover, feeling loss of control over life events, changes in their capacity to carry out family duties, as well as impaired body image may trigger psychosocial comorbidities (Weinberger et al., 2010). Breast cancer has one of the highest 5-year survival rates among female tumors (William, 2002). Although diagnosis of breast cancer may no longer be seen as fatal, it still reflects major stressful life condition. Early detection and treatment of depression in breast cancer not only significantly improved QOL but also proved to increase survival rate (Ahlberg et al., 2004). Depression is often underestimated among women with cancer breast, with a varying prevalence between 10 and 86% (Zabalegui et al., 2005; Pasquini and Biondi, 2007).

In agreement with the present study, a high prevalence rate of depression was found among patients with breast cancer, reaching 54% for moderate to severe depression and 32% for mild depressive symptoms. Many other authors such as Sharma and Zhang (2015) estimated depression prevalence to be as high as 93.4%. Other authors revealed much less prevalence rate for depression among patients with breast cancer. A Chinese study revealed 26% depression rate (Chen e*t al.,* 2009). Kovacs *et al.,* (2011) found depression among patients with breast cancer to be 11 and 64% of which was mild depression using the short version of Beck Depression Inventory. Such wide variation may be attributable to selection criteria, ethnic and cultural background difference, and different psychometric assessment tools used for measurement.

In the present study, a significant positive correlation was found between quality of sleep and depression in breast cancer and a significant reverse correlation with QOL. Many authors and researchers highlighted the association

between sleep disturbance and poor sleep quality with depression in patients with breast cancer (Den Oudsten *et al.,* 2009; Bower *et al.,* 2011; Liu *et al.,* 2013).

In the current study, QOL was negatively correlated with depression and sleep quality. Depressive manifestations among patients with breast cancer contribute to poor QOL as found by multiple articles in literature replicating such association (Koch *et al.,* 2014; Stagl *et al.,* 2015a, 2015b; Brunault *et al.,* 2016). Sleep disturbance and poor sleep is part of symptomatology of depressive disorders which may in part explain the existence of a negative correlation between poor sleep and QOL (McEwen and Karatsoreos, 2015; Paunio *et al.,* 2015). Authors even highlighted the significant association of sleep disturbance and poor QOL in such specific population of women with breast tumor (Zeitlhofer *et al.,* 2000; Fortner *et al.,* 2002; Strine and Chapman, 2005; Lo and Lee, 2012).

CONCLUSION

Poor sleep quality, which can be easily screened by PSQI, can be clinically correlated with presence of depression and poor QOL. Although sleep disturbance is often overlooked and underestimated, it is significantly correlated with other major mental health issues that necessitate professional psychological and psychiatric aide.

LIMITATION

Our study is limited by sample size that went smaller with subcategorization, leading to the use of nonparametric rather that parametric statistical test. Screening for depression was made using only one psychological scale that was not confirmed by more psychometric tools to confirm consistent subcategorization into mild, moderate, and severe depressive symptoms.

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CONFLICTS OF INTEREST
There are no conflicts of interest.

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