



Psychological distress impact and associated factors among Jordanian women diagnosed with breast cancer

Murad Abdul Raheem Younis^{123✉}, **Bachok Norsa'adah**^{4✉}, **Azizah Othman**⁵, **Yazan Shaqarin**⁶, **Hani Alqudah**⁷, **Shaimaa Shamoun**⁸

¹PhD-Candidate Student in Public Health & Epidemiology, Unit of Biostatistics & Research Methodology, School of Medical Sciences, Universiti Sains Malaysia, 16150, Kota Bharu, Kubang Kerian, Kelantan, Malaysia

²Lecturer in Public Health, Assistant Medical Science Department, Community College, Tabuk University, Kingdom of Saudi Arabia

³Clinical Nurse Specialist, Infection Control Department, AL Bashir Hospital, Ministry of Health, Amman, Jordan

⁴Professor in Epidemiology & Biostatistics, Unit of Biostatistics & Research Methodology, School of Medical Sciences, Universiti Sains Malaysia, 16150, Kota Bharu, Kubang Kerian, Kelantan, Malaysia

⁵Associate Professor in Clinical Psychology, Department of Pediatrics, School of Medical Sciences, Universiti Sains Malaysia, 16150, Kota Bharu, Kubang Kerian, Kelantan, Malaysia

⁶Medical Oncologist Doctor, Radiation Oncology Department, AL Bashir Hospital, Ministry of Health, Amman, Jordan

⁷Assistant Professor, Nursing Director Department, AL Bashir Hospital, Ministry of Health, Amman, Jordan

⁸Oncology Nurse Specialist, Radiation Oncology Department, AL Bashir Hospital, Ministry of Health, Amman, Jordan

✉Corresponding author

Murad Younis; Norsa'adah Bachok; Unit of Biostatistics & Research Methodology, School of Medical Sciences, Universiti Sains Malaysia, 16150, Kota Bharu, Kubang Kerian, Kelantan, Malaysia.

Email: Murady82@yahoo.com (Murad Younis);

Email: Norsaadah@usm.my (Norsa'adah Bachok)

Article History

Received: 05 May 2020

Reviewed: 06/May/2020 to 26/June/2020

Accepted: 27 June 2020

E-publication: 04 July 2020

P-Publication: July - August 2020

Citation

Murad Abdul Raheem Younis, Bachok Norsa'adah, Azizah Othman, Yazan Shaqarin, Hani Alqudah, Shaimaa Shamoun. Psychological distress impact and associated factors among Jordanian women diagnosed with breast cancer. *Medical Science*, 2020, 24(104), 2610-2619

Publication License



This work is licensed under a Creative Commons Attribution 4.0 International License.

General Note



Article is recommended to print as color digital version in recycled paper.

ABSTRACT

Background: Patients with breast cancer often experience an extremely high psychological distress. Psychological distress includes both depression and anxiety as a specific framework. Existing study in these psychological symptoms (either anxiety or depression) were more strongly associated with the level of pain that is unavailable in breast cancer patients. This research aims to compare the levels of depression and anxiety among patients with different levels of psychological distress. The association between changes in distress at baseline and time of admissions with depression and anxiety was examined. **Methods:** This is a cross-sectional descriptive study. The study included two hundred female people who are suffering from breast cancer. They were tested using the Hospital Anxiety and Depression Scale (HADS) at the time of diagnosis -Baseline and during admission. The data were collected on age, ethnicity, types of treatment and cancer staging. **Results:** There is no significant difference of mean anxiety between intervention and control group at baseline ($P = 0.361$) and admission time ($P = 0.385$) but various age groups showed a statistically significant difference on their corresponding mean perceived anxiety ($P=0.028$) with having previous medical insurance ($P = 0.050$). Also there is no significant difference of mean depression in baseline and admission time. Aged women experience less depression, although there is no significant difference. Women without previous medical insurance have higher level of depression compare with others ($P = 0.003$). **Conclusion:** Anxiety and depression are a type of severe psychiatric condition that has attributed to the feelings of apprehension in breast cancer. Finding from this study would support screening for anxiety and depression, early diagnosis, and counselling to improve the psychological well-being of patients with breast cancer. Further research would be required to assess the therapeutic interventions' efficacy.

Keywords: Breast Cancer, Anxiety, Depression, HAD score

1. INTRODUCTION

Depression and anxiety with breast cancer are the most common health issues affect the women and their family. Breast cancer, one of the most critical women's health issues in developing countries, accounts for approximately 30 percent of all forms of cancer among women (WHO, 2014). As for Jordan, breast cancer was the most common form of cancer affecting women and in most developing countries (Abu-Helalah et al., 2014; WHO, 2014). It was the most common cancer worldwide in women accounting for more than 25% of the total number of new cases diagnosed in 2019 (Rebholz et al., 2018). Cancer is one of the world's most common causes of death, accounting for 7.6 million deaths in 2008 (Alamgir, 2018).

The research community has been giving attention to the role of psychological variables, particularly those of anxiety and depression in disease progression and clinical outcomes. A breast cancer diagnosis is often followed by a severe and profound experience of psychological distress, with the symptoms of anxiety and depression being the most prominent (Shrestha et al., 2017). It should be noted that the prevalence rates of clinically relevant levels of anxiety and depression in patients with cancer were estimated at up to 45 per cent (Greenlee et al., 2017). It has been observed that psychological symptoms frequently decline over time, and in the clinical presentation of breast cancer it has also been observed that up to 30 per cent of these patients will continue to experience clinically significant levels of anxiety and depression during follow-up (Snoj et al., 2009). In a study of women with advanced breast cancer, Rodgers recorded that anxiety and depression, as measured by self-report instrument, were significant predictors of the response of patients to chemotherapy in terms of medical and psychological outcomes and patients who can experience anxiety and depression during diagnosis and management (Rodgers et al., 2005).

The Hospital Anxiety and Depression Scale (HADS) is a commonly used self-report tool designed as a brief method for evaluating the distinct aspects of anxiety and depression in non-psychiatric populations (Zigmond and Snaith, 1987; Snaith, 2003; Mitchell et al., 2010). It has been shown that the HADS as a psychological screening method provides clinically meaningful outcomes, in clinical group comparisons and in experiments of different aspects of cancer and quality of life (Hinz et al., 2019). The HADS has also been used widely in the clinical oncology setting as a screening and research tool (Saboonchi et al., 2013). The aim of the current study was to compare the depression and anxiety at baseline and at onset of admission by Hospital Anxiety and Depression Scale (HADS) among Arab breast cancer women in Jordan.

2. SUBJECTS AND METHODS

Study design

Descriptive cross-sectional study was used to fulfil the aim of the study.

Study site and settings

The study was conducted at Al-Bashir Hospital, Amman, Jordan. Al-Bashir Hospital is a tertiary health institution and one of the two centres with a radiotherapy facility in the central region of Jordan.

Subject type and criteria

All Jordanian women in patient at Al-Basher hospital in Amman during the study period fulfilled the inclusion and exclusion criteria. The target population of the study was all accessible women patients that diagnosed with breast cancer who received care and treatment at the Al-Bashir hospital Amman at the time of the study.

Inclusion criteria

Jordanian citizen has started chemotherapy or radiotherapy treatment.

20 to 65 years old aged women.

Women diagnosis as breast carcinoma according to ICD-10

Women with histologically confirmed with stage (0, I, II or III) of breast cancer.

Post-operative period of 6 months to 1 year .

Living permanently in Amman city

Able to read and communicate in Arabic and have telephone number

Exclusion criteria

Women who unable to attend the program or complete the questionnaires due to time constraints

Women with History of psychiatric disorders or chronic systemic diseases such as rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis (based on the screening from medical files).

Women who participating in similar study

Patient with severe depression and anxiety during baseline survey (Scores as normal 0-7, mild 8-10, moderate 11-14, and severe 14-21: According to HADS)

Subject size

100 participants per group (200 participants in total) were recruited in order to achieve a statistical power of 80%, based on alpha of 0.05 and expected mean effect size difference between the groups. The sample size was calculated using STATA software (sample size calculation for test of means with repeated measures).

Tools of data collection

The study utilised two questionnaires

1. Sociodemographic Data & Clinical Characteristics of Women with Breast Cancer questionnaire: This comprised 55 questions relating to age, educational level, employment Status, marital status, monthly income and duration of marriage, occupation, no of children, menopausal state. As well as medical history, which including on chronic disease, family history. And the characteristics questions which include on treatment methods, Type of surgery, post-operation surgery and histopathology type (TNM) stage and grade.

2. Hospital Anxiety and Depression Scale (HADS): There is seven subscales in anxiety and depression scale.

2. METHODS

Ethical committee approval number & details

This study was approved by the ethics committee on USM & JMOH. The author was published the protocol of this clinical trial under his name as Mr. Murad Younis, the registration of the protocol was done as prospective registration with ACTRN registry. The registration number is: ACTRN12619000095167 date assigned 22/01/2019.

Validity and reliability

The face validity was done, and it was good, and respondents find it easy to complete and acceptable. The internal reliability test was done for Hospital Anxiety and Depression (HADS) Inventory which is equal to 0.75.

Data collection procedure

All breast cancer patients who are available and fulfil the inclusion and exclusion criteria during the study period were recruited. There is no sampling method applied. The total number of 200 patients was included, 100 participants in the intervention group and 100 participants in the control group. Each patient had equal chance to be included in either group. The researcher was screened patients one by one who fulfil inclusion and exclusion criteria by using telephone number screening script the patients. Also check for Medical record file on the consultation paper history/record with the psychiatrist. Patients who have been seen by psychiatrists were excluded from the study. The researcher was invited the eligible patients for participation in this study. The participants were for verbal and written consent in Arabic language. Patients who agree to participate were signed on the consent form and were receiving a copy of the participation information in their record. The expected duration of participation in this study was two days to finish the follow up phases of study for two weeks and 12 weeks.

Randomization

The randomization was done using random allocation sequence by randomized block design (RBD) with computer-generated randomization in the block, to achieve the random allocation assignment for each patient in each group. Group allocation will not be known to data collectors, but the participants and main researcher knew exactly what are given in both groups.

Statistical analyses

Data analysis was performed using Statistical Package for Social Sciences (SPSS), version 24.0. A statistically significant difference was considered at p -value $\leq .05$, and a highly statistically significant difference was considered at p -value $\leq .001$, while the p -value $> .05$ indicates non-significant results. Means and Standard deviations were used to describe the continuous variables like age and disease duration and the frequencies and percentages were used to describe the categorically measured variables.

3. RESULTS

Anxiety level

Results found that women assigned to the intervention and control groups may not differ significantly on their corresponding mean perceived anxiety at admission time ($P=0.385$). Although, women with various age groups showed a statistically significant difference on their corresponding mean perceived anxiety ($P=0.028$) (Table 1).

However, breast cancer diagnosed women with different educational levels did not differ significantly on their mean perceived anxiety levels at baseline, $p=0.361$, neither did those with different employment levels differ significantly on their mean perceived anxiety as well ($P=0.827$). Results also showed a small difference in mean perceptions of anxiety between married and unmarried women. Those who are ever married perceived slightly higher anxiety than those unmarried without any statistically significant difference ($P=0.198$). There were no statistically significant mean differences on the measured anxiety levels for the breast cancer diagnosed women with difference husband employment and household income levels. However women who had medical insurance experienced less baseline anxiety ($M=9.1$, $SD=3.5$) than those who're not medically insured ($M=10.2$, $SD=3.8$) ($P = 0.051$), suggesting that women's current medical insurance may affect (enhance in fact) their anxiety level at admission time (Table 2) (Figure 1).

Table 1 Bivariate analysis of the breast cancer diagnosed women perceived Overall Anxiety (HAADS) at baseline. (N=200)

	Baseline Anxiety		
	Mean (SD)	test statistic	P-value
Patient group			
Control	9.2 (3.5)	t (198) =0.87	0.385
Intervention	9.6 (3.6)		
Age (years)			
26-36 Years	10.94 (4.4)	f (3,196) =3.1	0.028
37-46 Years	9.81 (3.3)		

47-56 Years	9.23 (3.6)		
>=57 Years	8 (3.4)		
Educational attainment level			
Literacy	8.77 (3.7)	f (2,197) =1.02	0.361
Secondary and less than high school	9.68 (3.4)		
Diploma, Bachelor/higher	9.03 (3.8)		
Patients Employment status			
Housewife	9.34 (3.5)	f (2,197) =0.19	0.827
Private sector employed	9.1 (4.1)		
Government employed	9.81 (4)		
Marital state/social state			
Never Married	8.46 (3.5)	t (31.40) =1.30 adj.	0.198
Ever Married	9.49 (3.6)		
Husband's employment state			
Single woman	8.96 (3.7)	f (2,197) =0.71	0.494
Not working husband	9.22 (3.6)		
Employed	9.66 (3.5)		
Households monthly income (Jordan dinars, mean (SD))			
50-220 JOD	9.10 (3.6)	f (3,196) =1.16	0.327
221-440 JOD	9.19 (3.6)		
441-660 JOD	9.83 (3.5)		
>660 JOD	10.85 (3.7)		
Medical health insurance			
No	10.21 (3.8)	t (132.2) =1.96 adj.	0.050
Yes	9.10 (3.5)		
Type of Household			
Rented House	9.10 (3.6)	t (198) =1.1	0.293
Owned House	9.61 (3.6)		
Socioeconomic Index, mean (SD)			
Very Low	8.47 (3.4)	f (3,196) =0.98	0.404
Low	9.58 (4.1)		
Medium	9.64 (3.4)		
High	8.95 (2.9)		

Table 2 Multivariate Linear Regression Analysis of the predictors of breast cancer diagnosed women level of anxiety at admission time. (N=200)

	Beta coefficient	Std. Error	Standardized Beta	t-value	P-value
(Constant)	12.339	2.171		5.682	<0.001
Age of women (years)	-.076	.034	-.177	-2.277	.024
Employment status= working woman	.282	.451	.052	.626	.532
Marital state= Ever married	1.291	1.306	.114	.988	.324
Health insured= Yes	-1.428	.606	-.177	-2.356	.020
Educational Level	-.325	.448	-.057	-.724	.470
Mass size during diagnosis	-.140	.118	-.087	-1.183	.238

Total Number of breast symptoms	.296	.175	.122	1.696	.092
Residence type= owned	.827	.517	.116	1.601	.111
Other comorbidity=Yes	-.213	.606	-.028	-.352	.725
Chemo before surgery= Yes	-.418	.617	-.051	-.678	.499
Socioeconomic index	.355	.431	.100	.825	.411
Dependent Variable= Anxiety at baseline. Model overall significance $f(13,177) = 2.50$, $P = 0.004$, Model $R = 39\%$, $R\text{-squared} = 15.2\%$, $\text{adj. } r\text{-squared} = 9\%$.					

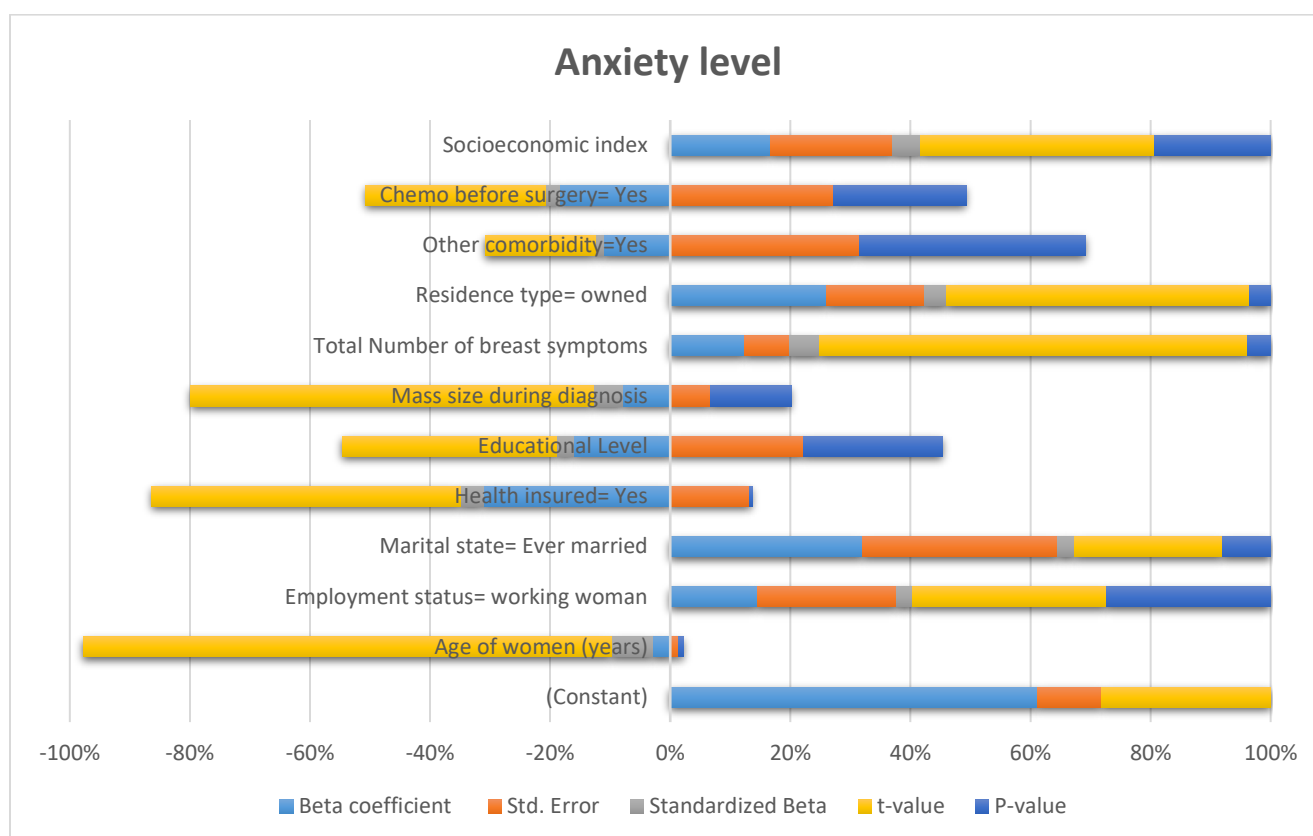


Figure 1 Predictors of breast cancer diagnosed women level of anxiety at admission time.

Depression level

In the tables 3 and 4, results suggested that the women in both control and intervened groups did not differ significantly on their mean perceived depression scores at admission time ($P=0.846$). Also, there were no statistically significant differences on the mean depression score between women in various age groups, although a downward trend in depression score across the women age groups, it is clear that as women's age tended to rise the mean depression score declined. Besides, the results showed no statistically significant mean differences on depression score between women with various educational levels, ($P=0.229$) and different employment levels ($P=0.093$). Moreover, women who're medically not insured have higher depression score at baseline ($M=8.89$, $SD=3.8$) than those who had previous medical insurance ($M=6.99$, $SD=4$) with a significant difference ($P=0.003$) (Figure 2).

Table 3 Bivariate analysis of the breast cancer diagnosed women perceived Overall Depression (HAADS score) at baseline. (N =200)

	Baseline Depression score		
	Mean (SD)	test statistic	P-value
Patient group			
Control	7.43 (4.1)	$t(198) = 0.20$	0.846

Intervention	7.54 (3.9)		
Age (years)			
26-36 Years	9.10 (4.5)	f (3,196) =1.83	0.142
37-46 Years	7.82 (3.9)		
47-56 Years	7.28 (3.6)		
>=57 Years	6.43 (4.6)		
Educational attainment level			
Literacy	8.55 (3.3)	f (2,197) =1.50	0.229
Secondary and less than high school	7.60 (3.9)		
Diploma, Bachelor/higher	6.90 (4.3)		
Patients Employment status			
Housewife	7.68 (3.9)	f (2,197) =2.41	0.093
Private sector employed	4.9 (3.5)		
Government employed	7.14 (4.5)		
Marital state/social state			
Never Married	7.32 (3.97)	t (198) =0.21	0.836
Ever Married	7.51 (4)		
Husband's employment state			
Single woman	6.92 (3.9)	f (2,197) =2.14	0.121
Not working husband	8.47 (4.1)		
Employed	7.29 (3.9)		
Households monthly income (Jordan dinars, mean (SD))			
50-220 JOD	7.10 (3.5)	f (3,196) =0.426	0.735
221-440 JOD	7.56 (4.3)		
441-660 JOD	7.44 (3.5)		
>660 JOD	8.46 (4.6)		
Medical health insurance			
No	8.89 (3.8)	t (198) =2.99	0.003
Yes	6.99 (4)		
Type of Household			
Rented House	7.59 (3.8)	t (198) =0.314	0.754
Owned House	7.41 (4.1)		
Socioeconomic Index, mean (SD)			
Very Low	7.13 (3.6)	f (3,196) =0.648	0.585
Low	6.92 (3.8)		
Medium	7.81 (4.3)		
High	7.7 (3.5)		

Table 4 Multivariate Linear Regression Analysis of the predictors of breast cancer diagnosed women level of Depression at admission time. (N=200)

	Beta coefficient	Std. Error	Standardized Beta	t-value	P-value
(Constant)	4.978	2.255		2.207	.028
Age of women (years)	-.027	.032	-.055	-.837	.404
Health insured= Yes	-1.445	.582	-.159	-2.481	.014
Women's employment	-.343	.397	-.055	-.863	.389
Required chemotherapy before surgery=yes	-.440	.567	-.049	-.776	.439

Degree of cancer disease	.739	.402	.114	1.837	.068
Household Socioeconomic index	.601	.322	.151	1.869	.063
Husbands employment= employed	-1.564	.644	-.196	-2.428	.016
Dependent Variable= Depression at baseline. Model overall significance $f(9,190) = 8.240$, $P = 0.004$, Model $R = 53\%$, $R\text{-squared} = 28.1\%$, $\text{adj. } r\text{-squared} = 24.7\%$.					

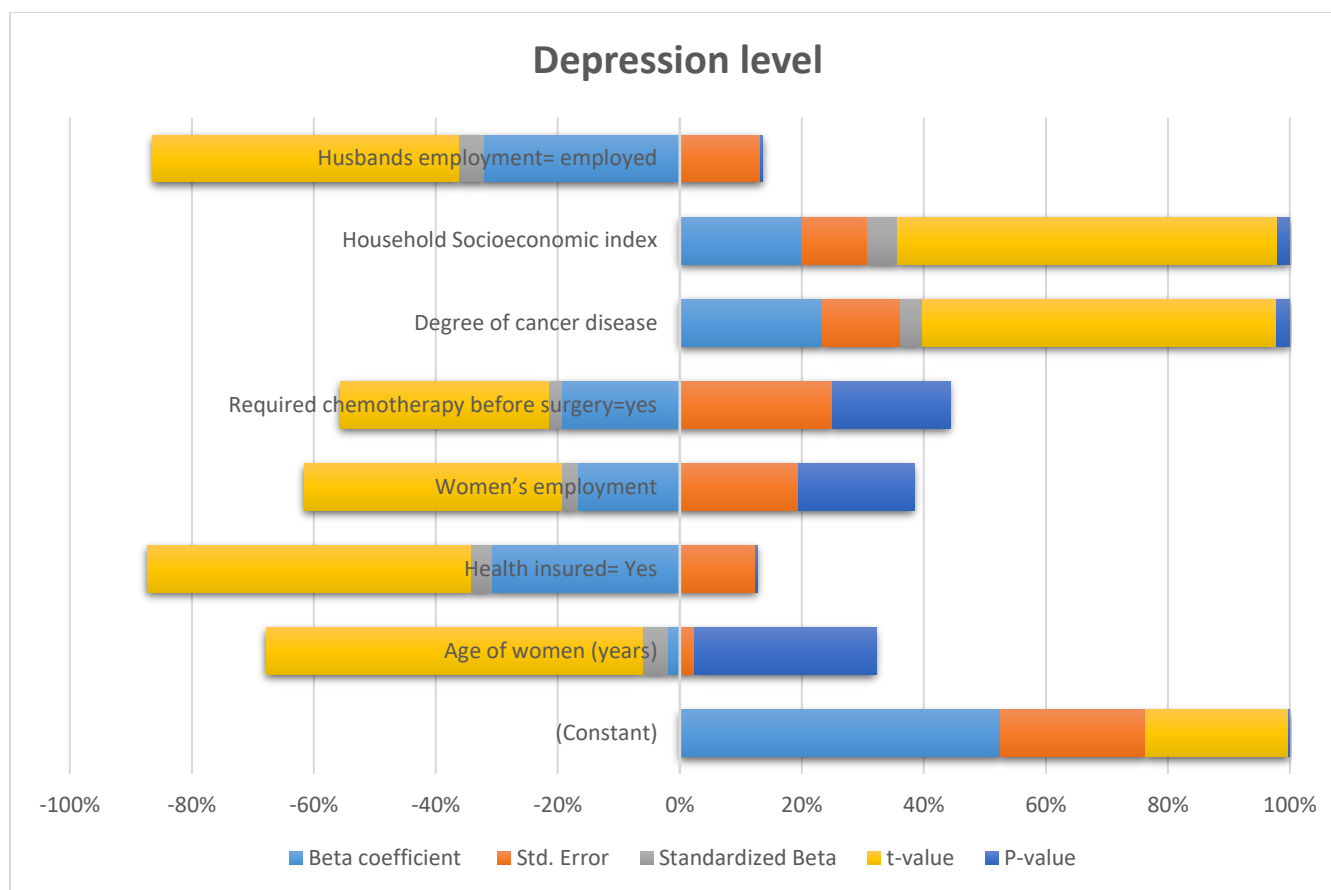


Figure 2 Predictors of breast cancer diagnosed women level of Depression at admission time

4. DISCUSSION

In the current study, we demonstrated that anxiety and depression were significantly associated with perceived discomfort among the breast cancer patients. This finding was reflected at each point of the study at the baseline, hospital admission time, where patients with moderate to severe distress scored on the scale of anxiety and depression. Breast cancer is the most common cancer and the second-largest cause of cancer death in women, meanwhile, breast cancer is classified as the most common cancer in the Arab world (Alamgir, 2018; Siegal et al., 2019; WHO, 2014). The understanding and assessment of psychological symptoms, well-being and social functioning of a person is likely to be influenced by socio-economic status, culture, beliefs and values. Although, in Western countries, the perceptions of breast cancer disease tend to be organized around severity dimensions and disease concept. In Eastern and Far East cultures like India, the Philippines and China, the perception of disease also includes spiritual and psychological dimensions. Indeed, women from the Middle East and Arab countries share a diverse collection of cultural traditions, beliefs, and values. Therefore, examination of psychological stress, anxiety and after treatment in breast cancer patients may disclose findings that may eventually require specific strategies to help cope with their psychological and medical condition (Abu-Helalah et al., 2014).

Although breast cancer is usually not painful, advanced disease could become painful, and there may be pain from metastatic disease as well (Abu-Helalah et al., 2014). The more the illness progresses, the more likely the patient will feel the pain. The diagnosis and treatment of breast cancer causes a significant impact on the psychological well being of the patients (Mitchell et al., 2011; Linden et al., 2012). However, the degree of their psychological response to the disease is different for individual patients with breast cancer. Psychological distress is a wide array of symptoms, ranging from common normal sensation of vulnerability and fear

to mental disabling conditions such as depression, anxiety and adjustment disorder (Siegal et al., 2019; Meijer et al., 2013). Depression and anxiety are known to have a positive correlation with the pain's affective and sensory components respectively; this can account for the very high prevalence of both disorders in the study population (Galloway et al., 2012). Advanced disease is also associated with other signs such as large swollen breasts, which cannot be covered, and bleeding and aggressive discharge (Clegg-Lamprey et al., 2009). These symptoms/signs can also increase patient's depression and anxiety levels. Other advanced disease symptoms such as breathlessness, cough and headaches may also be contributing factors. In his study, anxiety was found to be associated with the medical insurance of the patients ($P=0.050$). Depression was also found to be highly associated with the medical insurance status of the patients ($P = 0.003$). These outcomes matched with another research study in Malaysia (Hassan et al., 2015). Diagnosis and treatment of breast cancer can be quite costly, and the fear of failing to meet the financial obligations associated with managing their conditions could be responsible for the high prevalence of anxiety and depression and this may be an explanation for higher prevalence of anxiety and depression among patients without previous medical insurance (Abu-Helalah et al., 2014).

Depressed patients with breast cancer have been less proactive in pursuing care, more serious symptoms, and worse response to clinical therapy, longer recovery times and inconsistent outcomes (Segrin et al., 2007). Some other studies have found that anxiety and depression in breast cancer patients is a more prevalent psychological problem. Patients with breast cancer face considerable confusion about the course of the disease, anxiety and depression over potential recurrence and fear of physical suffering (Schnipper et al., 2015). Both these feelings contribute to the elevated rates of anxiety. Both depression and anxiety have strikingly deleterious impacts on the quality of life of breast cancer patients (Kirsh et al., 2004).

The study seems to have some limitations. First, the subjects for the study were recruited from a single hospital centre, Jordan. In the future, the generalizability of the samples may be enhanced by recruiting patients from various regional settings and locations of the country. Second, the other related distress factors have not been included in the current study. Third, we were just observing the relationship for the baseline and after diagnosis at the time of admission. For future research, the relationship between anxiety disorder and depression should be investigated for the longer progression of the disease as well as further follow-up study to assess the impact of psychological and lifestyle influences on patient prognosis.

5. CONCLUSION

In conclusion, patients with breast cancer experienced high levels of distress after diagnosis that included depression and anxiety. While both anxiety and depression were frequently observed in patients with breast cancer, they vary in their effect on distress level. Anxiety which may be linked to the feeling of confusion appears to play a more significant role in the patients with breast cancer feeling of distress. In contrast, there was also significant association between depression which consists of negative emotions and the level of perceived distress in cancer patients. In the management of mental wellbeing among breast cancer patients, anxiety was frequently overlooked compared to depression. With the current results, it is important to concentrate further on helping breast cancer patients alleviate their sense of anxiety and depression in the future to reduce their perceived level of distress.

Funding

This study received funding from USM bridging grant 304.PPSP, 6316342.

Acknowledgements

The author would like to express their appreciation to patients who participated in this study and to Mr Mohammad Al-Katteb for assistance and support.

Conflicts of interest

The authors declare that they have no conflict of interest.

Informed consent

Informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

The study was approved by the Medical Ethics Committee of Universiti Sains Malaysia (ethical approval code: USM/JEPeM/18080386) & Jordan Ministry of Health (JMOH) MB/Ethics Committee 9694.

REFERENCE

1. Abu-Helalah M, Al-Hanaqta M, Alshraideh H. Quality of life and psychological well-being of breast cancer survivors in Jordan. *Asian Pac J Cancer Prev*. 2014; 15:5927-36.
2. AlamgirM. Global and regional cancer epidemiology: according to world cancer report 2012 And Others. *JBUMDC*. 2018; 8(4):263-9.
3. Clegg-Lampthey JN, Baako BN, Badoe EA. The Breast. In: Baoe EA, Archampong EQ, da Rocha Afodu JT, editors. *Principles and practice of surgery including pathology in the tropics*. 4th ed. Accra: Department of Surgery; 2009: 488-519
4. Galloway SK, Baker M, Giglio P, et al. Depression and anxiety symptoms relate to distinct components of pain experience among patients with breast cancer. *Pain Res. Treat*. 2012; 2012:4.
5. Greenlee H, DuPont-Reyes MJ, Balneaves LG, et al. Clinical practice guidelines on the evidence-based use of integrative therapies during and after breast cancer treatment. *CA-Cancer J Clin*. 2017;67(3):194-232.
6. Hassan MR, Shah SA, Ghazi HF, et al. Anxiety and depression among breast cancer patients in an urban setting in Malaysia. *Asian Pac J Cancer Prev*. 2015; 16(9): 4031-5.
7. Hinz A, Herzberg PY, Lordick F, et al. Age and gender differences in anxiety and depression in cancer patients compared with the general population. *Eur J Cancer Care*. 2019;28(5): e13129.
8. Kirsh KL, McGrew JH, Passik SD. Difficulties in screening for adjustment disorder, Part II: An attempt to develop a novel self-report screening instrument in cancer patients undergoing bone marrow transplantation. *Palliat Support Care*. 2004; 2(1): 33-41.
9. Linden W, Vodermaier A, MacKenzie R et al. Anxiety and depression after cancer diagnosis: prevalence rates by cancer type, gender, and age. *J Affect Disord*. 2012; 141:343-51.
10. Meijer A, Roseman M, Delisle VC, et al. Effects of screening for psychological distress on patient outcomes in cancer: a systematic review. *J Psychosom Res*. 2013;75(1):1-17.
11. Mitchell AJ, Chan M, Bhatti H, et al. Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: a meta-analysis of 94 interview-based studies. *Lancet Oncol*. 2011;12(2):160-174.
12. Mitchell AJ, MeaderN, Symonds P. Diagnostic validity of the Hospital Anxiety and Depression Scale (HADS) in cancer and palliative settings: a meta-analysis. *J Affect Disord*. 2010; 126(3):335-48.
13. Rebholz WN, Cash E, Zimmaro LA, et al. Distress and quality of life in an ethnically diverse sample awaiting breast cancer surgery. *J Health Psychol*. 2018;23(11):1438-51.
14. Rodgers J, Martin CR, Morse RC, et al. An investigation into the psychometric properties of the Hospital Anxiety and Depression Scale in patients with breast cancer. *Health Qual Life Out*. 2005; 3: 41.
15. Saboonchi F, Wennman-Larsen A, Alexanderson K, Petersson LM. Examination of the construct validity of the Swedish version of Hospital Anxiety and Depression Scale in breast cancer patients. *Qual Life Res*. 2013; 22(10): 2849-56
16. Schnipper LE, Davidson NE, Wollins DS, et al. American Society of Clinical Oncology statement: a conceptual framework to assess the value of cancer treatment options. *J Clin Oncol*. 2015; 33(23): 2563.
17. Segrin C, Badger T, Dorros SM, et al.. Interdependent anxiety and psychological distress in women with breast cancer and their partners. *Psycho-Oncol*. 2007; 16(7): 634-43.
18. Shrestha JS, Shrestha A, Sapkota A, et al. Social support, quality of life and mental health status in breast cancer patients. *Cancer Rep Rev*. 2017;1(2): 1-5.
19. Siegel RL, Mille KD, Jemal A. Cancer statistics, 2019. *CA-Cancer J Clin*. 2019; 69(1):7-34.
20. Snaith RP, 2003. The hospital anxiety and depression scale. *Health Qual Life Out*. 2003;1(1):29.
21. Snoj Z, Akel, MP, Lièina M, et al. Psychosocial correlates of progesterone receptors in breast cancer. *Depress Anxiety*. 2009;26(6): 544-49.
22. World Health Orgniztion. The Global Burden of Disease. Geneva, Switzerland: WHO press; 2014: 27-36.
23. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr. Scand*. 1983; 67(6): 361-70.