

Assessment of the emotional condition of women with cancer

E. MESS¹, A. ZIEMBOWSKA¹, J. STAŚ², W. MISIĄG², M. CHABOWSKI^{1,3}

¹Department of Clinical Nursing, Division of Oncology and Palliative Care, Faculty of Health Science, Wrocław Medical University, Wrocław, Poland

²Student Research Group No. 180, Faculty of Medicine, Wrocław Medical University, Wrocław, Poland

³Department of Surgery, 4th Military Teaching Hospital, Wrocław, Poland

Abstract. – OBJECTIVE: The incidence of malignant tumors in women is constantly rising. In 2018, 83 876 women were diagnosed with cancer, and 46 028 died from it. Since the 1980s, the incidence of malignant tumors in women aged 19-44 has been growing dynamically, and in middle-aged women (between 45 and 64 years old), nearly one in two deaths are due to cancer – exceeding mortality from cardiovascular disease. Upon diagnosis, the patient who may have been healthy so far faces emotions such as fear, anxiety, and sadness, caused by the awareness of having a progressive disease. Therefore, a somatic disease may trigger the development of a psychological disorder. The purpose of the present paper was to assess the emotional condition of women with cancer.

MATERIALS AND METHODS: Our survey included 100 patients hospitalized at the radiotherapy, gynecologic oncology, and breast units of the Lower Silesian Cancer Center in Wrocław, Poland, between August and November, 2017. We used the Mini-Mental State Examination (MMSE), the Zung Self-Rating Depression Scale (ZSDS), the Hospital Anxiety and Depression Scale (HADS-M), and the C-HOBIC readiness for discharge questionnaire.

RESULTS: The mean patient age was 58.91 years (SD=13.74), the youngest patient was 23 years old and the oldest was 86 years old. More severe anxiety and depression symptoms were negatively associated with readiness for discharge. Among the women studied, widows and divorcees had higher levels of depression. Women who had completed primary education were more likely to suffer from anxiety than those with high school education. Duration of illness did not significantly affect the emotional condition of women undergoing cancer treatment. In the group of female cancer patients studied, more than half had no depressive symptoms.

CONCLUSIONS: Emotional disorders negatively affect patients' readiness for discharge. Anxiety is significantly associated with education level, and depression – with the patients' marital status.

Key Words:

Psycho-oncology, Anxiety, Depression, Zung, HADS-M, Readiness for discharge.

Introduction

The incidence of malignant tumors in women is constantly rising. In 2018, 83 876 women were diagnosed with cancer (2256 more than in 2016), and 46 028 died from it (1316 more than in 2016). Alarming, the incidence of malignant tumors in women aged 19–44 has been growing dynamically since the 1980s, and the age-standardized incidence rates (ESP 2013) for this group are twice as high for women as for men. In middle-aged women (between 45 and 64 years old), nearly one in two deaths is due to cancer (49% in 2018), exceeding mortality from cardiovascular disease. The most commonly diagnosed malignancies in women include breast cancer (22.5%), lung cancer (9.3%), endometrial cancer (7.2%), and colon cancer (6.0%)^{1,2}.

Upon receiving a cancer diagnosis, the woman faces emotions such as fear, anxiety, and sadness³. Patients diagnosed with cancer experience a constant threat to their life. They lose control of their daily life, and their future seems uncertain and filled with dread⁴. The woman must give up her current social roles, which are replaced with a new one — that of a patient. Women's emotional condition during cancer treatment is affected by a number of factors, including general discomfort, pain, or the need for multiple hospitalizations⁵. The treatment process constitutes a large burden, undermining the patient's physical and psychological wellbeing. Chemotherapy and radiation therapy are associated with distressing adverse effects, among which the most worrisome for patients include nausea and vomiting, fatigue, and

hair loss⁶. Disfiguring surgery impairs patients' self-esteem and quality of life, which has been described particularly well in the case of breast cancer. Mastectomy has a significant impact on patients' body image⁷. During hospitalization, patients may feel insufficiently informed about their condition, the course of disease, and further treatment, which additionally fuels their fear and uncertainty. A somatic disease may thus trigger the development of a psychological disorder. Common disorders of the kind include depression and anxiety. According to research, psychological disorders affect between 23.5 and 56.5% of cancer patients⁸. Depression is among the most common conditions accompanying cancers, especially in patients in palliative or hospice care⁹. Depressive disorders manifest with feelings of sadness, discouragement, despair, and helplessness. If the symptoms are severe and last for a long time, full-blown clinical depression may develop, sometimes accompanied by psychotic disorders. Notably, the severity of depressive symptoms is significantly associated with quality of life in cancer patients¹⁰. Anxiety disorders manifest with constant, chronic anxiety or transient episodes. They may significantly affect patients' attitudes and their motivation to start and continue treatment. The purpose of the present paper was to assess the emotional condition of women with cancer.

Materials and Methods

Our survey included 100 patients hospitalized at the radiotherapy, gynecologic oncology, and breast units of the Lower Silesian Cancer Center between August and November, 2017. In our study group, the most common diagnosis was breast cancer, with smaller percentages of patients with cervical cancer, lung cancer, and stomach cancer. Respondents were asked to complete the Mini-Mental State Examination (MMSE), the Zung Self-Rating Depression Scale (ZSDS), the Hospital Anxiety and Depression Scale (HADS-M), and the C-HOBIC readiness for discharge questionnaire. The mean patient age was 58.91 years (SD=13.74), the youngest patient was 23 years old and the oldest was 86 years old. Most respondents had completed high school education (52%), lived in cities (75%), were married (51%), and had children (84%). Duration of illness ranged between 1 month and 12 years, with the mean of 14.29 months

(SD=32). Inclusion criteria were age above 20 years and diagnosis of cancer during primary treatment or recurrence. Patients with cognitive impairment were excluded. All patients were informed that the study was strictly anonymous and that they could withdraw from it at any time. The study was approved by the Bioethics Committee (approval no. 676/2017).

Cognitive function was assessed using the MMSE questionnaire, which comprises 30 items addressing orientation to time and place, memory, attention and calculation, recall, naming objects, repetition and understanding, as well as reading, writing, and drawing. For each item, the patient can receive 1 point (30 points in total). Scores are interpreted as follows: no cognitive impairment (27-30 points), cognitive impairment without dementia (24-26), mild dementia (19-23), moderate dementia (11-18), and severe dementia (0-10)¹¹.

The Zung Self-Rating Depression Scale (ZSDS) was introduced in 1965. It comprises 20 statements, 10 of which refer to the presence of depressive symptoms, and 10 — to lack thereof. The patient uses a 4-item scale to select the answer that best reflects their current condition. The final score is a sum of all item scores and ranges between 20 and 80 points. Scores below 50 indicate no depression, 50–59 — mild depression, 60–69 — moderate depression, and 70–80 — severe depression¹².

Depressive symptoms in the patient group studied were also evaluated using the HADS-M scale, a modified version of the questionnaire by A. Zigmond and R. Snaith. The questionnaire comprises two separate subscales evaluating anxiety and depression, each containing 7 items, with two additional items concerning aggressiveness. Each item is rated on the following scale: 3 — strongly agree, 2 — agree, 1 — disagree, 0 — strongly disagree. Results in each subscale are interpreted separately, based on the total scores for the responses given (0-21 for anxiety and depression, 0-6 for aggressiveness). For anxiety and depression, scores of 0-7 indicate no abnormalities, 8-10 represent a borderline case, and scores of 11–21 points are considered abnormal^{13,14}.

Readiness for discharge was measured using the C-HOBIC questionnaire (discharge assessments) comprising eight items which rate the patient's ability to perform eight daily activities¹⁵. Each item is rated on a six-point scale. The total score is calculated as a mean from 8 responses, with interpretation following the scale for each

single item (0 — not prepared, 1 — poorly prepared, 2 — partially prepared, 3 — moderately prepared, 4 — well prepared, 5 — very well prepared). The scale reliability measured by Cronbach's α for internal consistency was 0.816.

Quantitative variables were analyzed using means, standard deviations, and median, quartile, minimum, and maximum values. Qualitative variables were analyzed using the counts and percentages of each value. As the variables analyzed did not have a normal distribution, comparisons between two groups were performed using the Mann-Whitney test, and in three or more groups — using the Kruskal-Wallis test. Where statistically significant differences were found, a post-hoc analysis was performed using the Dunn test to identify groups that were significantly different. Correlations between the variables' median and quartile values and value ranges were analyzed using Spearman's rank correlation coefficients¹⁶. Variable distribution normality was verified using the Shapiro-Wilk test. The analyses used a significance threshold of $p < 0.05$. The analyses were performed using the R software, version 3.4.3.

Results

Readiness for Discharge

Readiness for discharge was good in 44% of the patients, moderate in 27%, very good in 20%, partial in 7%, and poor in 2%.

The Kruskal-Wallis test and the Mann-Whitney test showed no correlation between education ($p = 0.214$), marital status ($p = 0.803$), residence ($p = 0.164$), or having children ($p = 0.588$) and readiness for discharge (Table I). Readiness

for discharge was inversely proportional to the severity of anxiety and depression symptoms ($p < 0.001$) (Table II). Associations between readiness for discharge and patient age ($p = 0.107$), duration of illness ($p = 0.467$), or depression severity ($p = 0.147$) were not statistically significant (Table II).

Zung Depression Scale, HADS Anxiety and Depression Scales

Using the Zung depression scale, mild depression was identified in 37% of the patients, and moderate depression in 7%.

Scores from the HADS-M anxiety subscale demonstrated marked anxiety in 17% and a borderline condition in 16%; based on the HADS-M depression subscale, 5% of patients had marked depression and 11% had a borderline result.

The analysis using the Kruskal-Wallis test showed an association between the HADS depression score and respondents' marital status ($p = 0.016$) (Table III)¹⁷. The post-hoc analysis demonstrated higher depression levels in widowed or divorced patients than in those who were unmarried. Based on the Kruskal-Wallis test results ($p = 0.048$), an association was identified between the HADS anxiety score and respondents' education (Table IV). Patients who had completed primary education had higher anxiety levels than those with a high school education. No association was, however, observed between anxiety or depression and having children ($p = 0.191$; $p = 0.169$) or residence ($p = 0.051$; $p = 0.345$) (Table V; Table VI).

Severity of Emotional Disorders

Based on Spearman's coefficient values, patient age ($p = 0.779$; $p = 0.774$), duration of illness

Table I. Correlations of readiness for discharge with respondents' education, having children, marital status, and residence.

Characteristic		Readiness for discharge [points]								<i>p</i>
		N	Mean	SD	Median	Min.	Max.	Q1	Q3	
Education level	Primary	16	3.54	0.82	3.52	2.12	5	3.03	4	0.214
	High school	52	3.67	0.98	3.88	1	5	3	4.38	
	College/University	32	3.95	0.8	4.12	1.75	5	3.38	4.5	
Having children	Childless	16	3.91	0.78	4.06	2.5	5	3.56	4.41	0.588
	Has children	84	3.71	0.93	3.88	1	5	3.12	4.5	
Marital status	Married	51	3.65	0.94	3.88	1.12	5	3.06	4.38	0.803
	Unmarried	16	3.88	0.68	3.94	2.75	5	3.5	4.41	
	Divorced	7	3.86	0.77	3.75	2.75	5	3.5	4.25	
	Widowed	26	3.8	1.01	4.06	1	5	3.03	4.5	
Residence	Rural	25	3.53	0.94	3.38	1.12	5	3	4.12	0.164
	Urban	75	3.81	0.89	3.88	1	5	3.25	4.5	

Table II. Correlations between the characteristics studied and readiness for discharge.

Characteristic	Correlation coefficient	<i>p</i>	Direction of correlation	Strength of correlation
Duration of illness and readiness for discharge	0.074	0.467	–	–
Depression severity (Zung scale) and readiness for discharge	0.146	0.147	–	–
Anxiety symptom severity and readiness for discharge	-0.397	< 0.001	Negative	Weak
Depression symptom severity and readiness for discharge	-0.38	< 0.001	Negative	Weak
Age and readiness for discharge	0.162	0.107	–	–

Table III. Marital status and HADS anxiety and depression scores.

HADS	Marital status	N	Mean	SD	Median	Min.	Max.	Q1	Q3	<i>p</i> *
Anxiety	Married	51	6.7	3.64	7	0	14	4	8.5	0.065
	Unmarried	16	3.94	2.59	3	1	10	2.75	4	
	Divorced	7	6.29	3.59	7	1	11	4.5	8	
	Widowed	26	6.54	4.74	4.5	0	16	3	10.75	
Depression	Married	51	3.55	3.02	2	0	11	1	6	0.016 DW > <i>p</i>
	Unmarried	16	2.31	2.06	1	0	7	1	4	
	Divorced	7	6.43	4.12	6	1	12	3.5	9.5	
	Widowed	26	5.27	3.9	4.5	0	13	2	7.75	

Table IV. Education level and HADS anxiety and depression scores.

HADS	Education level	N	Mean	SD	Median	Min.	Max.	Q1	Q3	<i>p</i> *
Anxiety	Primary	16	8.49	3.97	9	2	16	5.62	11.25	0.048 <i>p</i> > HS
	High school	52	5.58	3.6	4	0	14	3	8	
	College/University	32	6.02	4.02	6.5	0	14	3	8.25	
Depression	Primary	16	4.75	3.86	3.5	0	12	2	6.5	0.591
	High school	52	3.98	3.44	2.5	0	13	1	6	
	College/University	32	3.66	3.12	3.5	0	10	1	6	

Table V. Having children and HADS anxiety and depression scores.

HADS	Having children	N	Mean	SD	Median	Min.	Max.	Q1	Q3	<i>p</i> *
Anxiety	Childless	16	5.08	3.4	4.5	1	13	2.75	7	0.191
	Has children	84	6.4	3.97	6	0	16	3	9	
Depression	Childless	16	5	3.69	4	1	12	2	7	0.169
	Has children	84	3.81	3.32	3	0	13	1	6	

Table VI. Residence and HADS anxiety and depression scores.

HADS	Residence	N	Mean	SD	Median	Min.	Max.	Q1	Q3	<i>p</i> *
Anxiety	Rural	25	7.6	4.34	8	0	14	4	12	0.051
	Urban	75	5.72	3.65	5	0	16	3	7.5	
Depression	Rural	25	5.08	4.38	4	0	12	1	10	0.345
	Urban	75	3.64	2.94	3	0	13	1	5.5	

($p=0.994$; $p=0.976$) or Zung depression score ($p=0.526$; $p=0.306$) do not affect the severity of anxiety or depression (Table VII).

The analysis of variance (ANOVA) demonstrated no association between depressive symp-

tom severity and respondents' education or marital status ($p>0.05$). Correlations between depression severity and respondents' residence or having children were not statistically significant (Student's *t*-test: $p>0.05$).

Table VII. Correlations between HADS scores and the characteristics studied.

HADS — correlation		Correlation coefficient	<i>p</i>	Direction of correlation	Strength of correlation
With the Zung depression scale	Anxiety	0.064	0.526	—	—
	Depression	-0.103	0.306	—	—
With age	Anxiety	0.028	0.779	—	—
	Depression	-0.029	0.774	—	—
With duration of illness	Anxiety	0.001	0.994	—	—
	Depression	0.003	0.976	—	—

Discussion

Cancer diagnosis affects women's emotional condition, leading to anxiety and depression. Psychological health deterioration undoubtedly undermines the quality of life (QoL) of cancer patients¹¹. The assessment of the emotional condition of women with cancer is highly relevant, considering, among other factors, the increased risk of cancer mortality in patients diagnosed with psychological disorders, especially if the mental health issues first appeared after the cancer diagnosis¹⁸. Our present findings indicate a greater severity of anxiety in those women with malignancies who had only completed primary education. Higher levels of education may be associated with more knowledge on cancers and a better understanding of one's illness, which is why better-educated women are less likely to have anxiety or depression, and if they do, the disorders are less severe¹⁹. The analysis of our data also showed a significantly higher severity of depressive symptoms in widowed or divorced patients. Widows and divorcees may experience more severe emotional problems due to the lack of support from a partner and feelings of loneliness and isolation in the face of their disease. Research has repeatedly demonstrated the importance of social support for cancer patients, as more support is associated with less severe psychological disorders^{20,21}. Our findings are in line with those reported in other studies, where the risk of depression and anxiety was also higher in those women with cancer who were widowed or had less education²¹⁻²³.

In our group of 100 respondents, no impact of illness duration on anxiety and depression levels was demonstrated. However, there has been a 5-year cohort study showing that the incidence of anxiety and depression is the highest within one year of a cancer diagnosis and nearly twice as high as in the general population of women²⁴. That study also demonstrated a stronger associa-

tion with the patient than with the cancer type or its treatment. Other papers show that the severity of emotional disorders increases the most within 6-12 months of the diagnosis but remains higher than in the general population of women for 5 years²⁵⁻²⁸.

The analysis of our data demonstrated no significant correlations with patient age. It is, however, quite likely that an association between the women's age and their emotional condition would have been found, had the study included a larger group of patients with more age differences. Findings from similar studies do show more depression in younger patients^{29,30}. A cancer diagnosis forces women to give up their previous social roles. This is more difficult to accept for younger women, which contributes to the development of anxiety or depression.

We found no association between anxiety or depression, and their severity, and having children. In a study by Nell et al³¹, patients who had children under 18 years of age had significantly more death anxiety. This can be due to concerns about not being able to care for one's children while they are still dependent and also more susceptible to psychological distress resulting from their parent's health condition. The described discrepancy in findings may be due to the fact that Nell et al³¹ studied patients with advanced cancers, while in the present study, cancer stage was not considered.

In our study, the women's residence was not significantly associated with anxiety or depression and their severity. In a study by Tsaras et al²⁵, rural residence was identified as a significant risk factor for both anxiety and depression, with factors such as poorer access to medical care cited as a possible reason. Another study, by Rogers et al³², in a group of women who had completed their breast cancer treatment and lived in rural areas, demonstrated a beneficial impact of physical activity (e.g., gardening) on depression symptoms. One topic that undoubtedly merits

attention in the context of patients living in rural areas and their psychological condition is access to transportation³³.

According to other studies, the relationship between religiosity and prevalence of depression among cancer patients is significant³⁴. The study presented by Haghighi³⁵ focused on the influence of various religious coping strategies on the level of depression in cancer patients. A strong negative correlation was observed in the presence of an avoidant religious relationship. In another study, by Olsen et al³⁶, positive religious coping was a predictor of an improvement in the emotional condition, while negative religious coping was associated with worse mental health outcomes. In the study by Aukst-Margetić et al³⁴, high-religiosity was associated with lower incidence of depression among oncological patients. Religion strengthens a sense of belonging to a specific community, which provides psychological support for those who struggle with cancer. Moreover, it was indicated that religion is a more accessible coping mechanism for people with a worse socioeconomic status. Other studies present a stronger association of anxiety and depression with negative religious coping than with positive coping. Feeling negative emotions to God predicted worse mental health and lower life satisfaction, while a positive attitude was not associated with any measures of increase in the QoL³⁷.

In this and other, independent studies, not all of the women studied developed psychological disorders. The absence of depression in the study does not necessarily mean that women with malignancies, even in remission, are entirely free of any psychological issues. Concerns about the future, fear of disease recurrence, and loss of hope may all be expected in this patient group^{38,39}.

The present study has identified the socio-demographic risk factors for psychological disorders in women suffering from cancer, as well as the associations between these factors and the patients' readiness for discharge. It may be seen as confirmation that the emotional condition of women with cancer must be closely monitored, and that guidelines for better psychological care in this patient group are needed.

Conclusions

Emotional disorders negatively affect patients' readiness for discharge. Anxiety is significantly associated with education level, and depression — with the patients' marital status.

Conflict of Interest

The Authors declare that they have no conflict of interests.

ORCID ID

Eleonora Mess: 0000-0001-5041-383X. Jakub Staś: 0000-0002-5072-1290. Weronika Misiąg: 0000-0001-8638-2350. Mariusz Chabowski: 0000-0002-9232-4525.

References

- 1) Wojciechowska U, Didkowska J, Michałek I, Olasek P, Ciuba A. Cancer in Poland in 2018. Polish National Cancer Registry, 2020.
- 2) Wojciechowska U, Czaderny K, Ciuba A, Olasek P, Didkowska J. Cancer in Poland in 2016. Polish National Cancer Registry, 2018.
- 3) Beatty L, Oxlad M, Koczwara B, Wade TD. The psychosocial concerns and needs of women recently diagnosed with breast cancer: a qualitative study of patient, nurse and volunteer perspectives. *Health Expect* 2008; 11: 331-342.
- 4) Shinn EH, Taylor CL, Kilgore K, Valentine A, Bodurka DC, Kavanagh J, Sood A, Li Y, Basen-Engquist. Associations with worry about dying and hopelessness in ambulatory ovarian cancer patients. *Palliat Support Care* 2009; 7: 299-306.
- 5) Nuhu FT, Odejide OA, Adebayo KO, Yusuf AJ. Psychological and physical effects of pain on cancer patients in Ibadan, Nigeria. *Afr J Psychiatry (Johannesbg)* 2009; 12: 64-70.
- 6) Lorusso D, Bria E, Costantini A, Di Maio M, Rosti G, Mancuso A. Patients' perception of chemotherapy side effects: expectations, doctor-patient communication and impact on quality of life – An Italian survey. *Eur J Cancer Care (Engl)* 2017; 26: e12618.
- 7) Enache RG. The relationship between anxiety, depression and self-esteem in women with breast cancer after surgery. *Procedia Soc Behav Sci* 2012; 33: 124-127.
- 8) Härter M, Reuter K, Aschenbrenner A, Schretzmann B, Marschner N, Hasenburg A, Weis J. 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.
- 9) Montazeri A. Health-related quality of life in breast cancer patients: a bibliographic review of the literature from 1974 to 2007. *J Exp Clin Cancer Res* 2008; 27: 32.
- 10) Visser M, Smets E. Fatigue, depression and quality of life in cancer patients: how are they related? *Support Care Cancer* 1998; 6: 101-108.
- 11) Folstein MF, Folstein SE, McHugh PR. "Mini-mental state": a practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* 1975; 12: 189-198.
- 12) Zung WW. A self-rating depression scale. *Arch Gen Psychiatry* 1965; 12: 63-70.

- 13) Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand* 1983; 67: 361-370.
- 14) De Walden-Gałuszko K, Majkiewicz M. Ocena jakości opieki paliatywnej w teorii i praktyce. Medical University of Gdańsk, 2000.
- 15) Andruszkiewicz A, Kubica A, Nowik M, Michalski P, Idczak H. Assessment of readiness for discharge of patients with chronic diseases. *Scientific Issues of Health Protection Public Health and Governance* 2016; 14: 44-52.
- 16) Hinkle DE, Wiersma W, Jurs SG. *Applied statistics for the behavioral sciences*. Houghton Mifflin, 2003.
- 17) Cvetković J, Nenadović M. Depression in breast cancer patients. *Psychiatry Res* 2016; 240: 343-347.
- 18) Zhu J, Fang F, Sjölander A, Fall K, Adami HO, Valdimarsdóttir U. First-onset mental disorders after cancer diagnosis and cancer-specific mortality: a nationwide cohort study. *Ann Oncol* 2017; 28: 1964-1969.
- 19) Kállay É, Pinteá S, Dégi CL. Does knowledge of diagnosis really affect rates of depression in cancer patients? *Psychooncology* 2016; 12: 1418-1423.
- 20) Montazeri A, Jarvandi S, Haghighat S, Vahdani M, Sajadian A, Ebrahimi M, Haji-Mahmoodi M. Anxiety and depression in breast cancer patients before and after participation in a cancer support group. *Patient Educ Couns* 2001; 45: 195-198.
- 21) Bener A, Alsulaiman R, Doodson L, Agathangelou T. Depression, hopelessness and social support among breast cancer patients: in highly endogamous population. *Asian Pac J Cancer Prev* 2017; 18: 1889-1896.
- 22) Hopwood P, Sumo G, Mills J, Haviland J, Bliss JM; START Trials Management Group. The course of anxiety and depression over 5 years of follow-up and risk factors in women with early breast cancer: results from the UK Standardisation of Radiotherapy Trials (START). *Breast* 2010; 19: 84-91.
- 23) 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.
- 24) 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.
- 25) Tsaras K, Papathanasiou JV, Mitsi D, Veneti A, Kelesi M, Zyga S, Fradelos EC. Assessment of depression and anxiety in breast cancer patients: prevalence and associated factors. *Asian Pac J Cancer Prev* 2018; 19: 1661-1669.
- 26) Li L, Yang Y, He J, Yi J, Wang Y, Zhang J, Zhu X. Emotional suppression and depressive symptoms in women newly diagnosed with early breast cancer. *BMC Womens Health* 2015; 15: 91.
- 27) Yang H, Brand JS, Fang F, Chiesa F, Johansson ALV, Hall P, Czene K. 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.
- 28) Krebber AM, Buffart LM, Kleijn G, Riepma IC, de Bree R, Leemans CR, Becker A, Brug J, van Straten A, Cuijpers P, Verdonck-de Leeuw IM. Prevalence of depression in cancer patients: a meta-analysis of diagnostic interviews and self-report instruments. *Psychooncology* 2014; 23: 121-130.
- 29) Linden W, Vodermaier A, Mackenzie R, Greig D. Anxiety and depression after cancer diagnosis: prevalence rates by cancer type, gender, and age. *J Affect Disorders* 2012; 141: 343-351.
- 30) Srivastava V, Ansari MA, Kumar A, Shah AG, Meena RK, Sevach P, Singh OP. Study of anxiety and depression among breast cancer patients from North India. *Clin Psychiatry* 2016; 2: 4.
- 31) Neel C, Lo C, Rydall A, Hales S, Rodin G. Determinants of death anxiety in patients with advanced cancer. *BMJ Support Palliat Care* 2015; 5: 373-380.
- 32) Rogers LQ, Markwell SJ, Courneya KS, McAuley E, Verhulst S. Physical activity type and intensity among rural breast cancer survivors: patterns and associations with fatigue and depressive symptoms. *J Cancer Surviv* 2011; 5: 54-61.
- 33) Arcury TA, Preisser JS, Gesler WM, Powers JM. Access to transportation and health care utilization in a rural region. *J Rural Health* 2005; 21: 31-38.
- 34) Aukst-Margetić B, Jakovljević M, Margetić B, Biščan M, Samija M. Religiosity, depression and pain in patients with breast cancer. *Gen Hosp Psychiatry* 2005; 27: 250-255.
- 35) Haghighi F. Correlation between religious coping and depression in cancer patients. *Psychiatr Danub* 2013; 25: 236-240.
- 36) Olson MM, Trevino DB, Geske JA, Vanderpool H. Religious coping and mental health outcomes: an exploratory study of socioeconomically disadvantaged patients. *Explore (NY)* 2012; 8: 172-176.
- 37) Hebert R, Zdaniuk B, Schulz R, Scheier M. Positive and negative religious coping and well-being in women with breast cancer. *J Palliat Med* 2009; 12: 537-545.
- 38) Tadayon M, Dabirizadeh S, Zarea K, Behroozi N, Haghighizadeh MH. Investigating the relationship between psychological hardness and resilience with depression in women with breast cancer. *Gulf J Oncolog* 2018; 1: 23-30.
- 39) Mutsaers B, Butow P, Dinkel A, Humphris G, Maheu C, Ozakinci G, Prins J, Sharpe L, Smith A, Thewes B, Lebel S. Identifying the key characteristics of clinical fear of cancer recurrence: an international Delphi study. *Psychooncology* 2020; 29: 430-436.