Original Article

The Relationship between Depressive Symptoms and Demographic-Medical Characteristics among Elder People with Cancer

Sepideh Ladaninejad[1], Ehteramsadat Ilali[1], Nouroeddin Mousavinasab[2], Zohreh Taraghi[3]

[1]Geriatric Nursing Department, Nursing and Midwifery Faculty, Mazandaran University of Medical Sciences, [2]Biostatistics Department, Health Faculty, Mazandaran University of Medical Sciences, [3]Gastrointestinal Cancer Research Center, Cancer Research Institute, Mazandaran University of Medical Sciences, Sari, Iran

Corresponding author: Zohreh Taraghi, PhD

Gastrointestinal Cancer Research Center, Cancer Research Institute, Mazandaran University of Medical Sciences, Sari, Iran

Tel: +981133367342; Fax: +981133368915

E-mail: ztarair@yahoo.com

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ABSTRACT

Objective: Cancer is one of the most common life-threatening diseases and a great source of stress in patients. The risk factors of depression differ in elder people compared to other age groups. The present study was designed to determine the relationship between depressive symptoms and demographic-medical characteristics among elder people with cancer. **Methods:** This cross-sectional correlational study recruited 200 elder people with cancer. The eligible patients completed the demographic-medical characteristics questionnaire, the Geriatric Depression Scale, the Abbreviated Mental Test, the Activities of Daily Living Scale, and the Multidimensional Perceived Social Support Scale. The findings were analyzed in SPSS software version 21.0 using the Kruskal–Wallis and Mann–Whitney tests. **Results:** A total of 50% of the elder people in this study had mild depression, 18.5% had moderate depression, and 2.5% had severe depression. A significant relationship was observed between depression in the elder people and their marital status ($P = 0.025$), living arrangement ($P = 0.013$), and income ($P = 0.021$). Depression also had a significant relationship with diabetes ($P = 0.044$) and respiratory diseases ($P = 0.040$). A significant relationship was also observed between depression and colon cancer ($P = 0.007$), and the mean depression was lower in the patients with colon cancer compared to those with other cancers. Depression had a significant relationship with complications, including pain ($P = 0.001$), nausea ($P < 0.001$), vomiting ($P = 0.001$), hair loss ($P < 0.001$), and shortness of breath ($P = 0.028$). **Conclusions:** Given the high prevalence of depression in this age group, screening and counseling-supportive interventions are recommended for helping prevent depression and come to terms with cancer.

Key words: Cancer, depression, elder people

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Introduction

Cancer is one of the most common chronic diseases of the present era, that is, life-threatening and a great source of stress for patients.[1] According to the World Health Organization (WHO) statistics, 10 million cancer patients are identified every year, and this figure will reach 15 million by 2020.[2] Knowledge of cancer diagnosis is very unpleasant and can be a shocking and concerning experience for the individual. This disease causes many problems in the normal path of life and also in all its physical, psychological, social, financial, and family dimensions.[3] Elder people are at a greater risk of cancer due to their longer duration of contact with carcinogens,[4] and half of the cancers and more than three-quarters of cancer-related mortalities happen in people elder than the age of 65 years.[3,5] Based on one epidemiological study, the largest number of cancer cases among Iranian elder adults was observed in the age group of 80–84 years, but this prevalence decreases after the age of 85 years.[4] Cancer and its associated problems reduce the patients' quality of life and make them vulnerable to anxiety and depression.[6] The prevalence of depression is 17%–26% in oncology patients,[5] although it varies widely with cancer type, treatment phase, and method of diagnosis.[7] Depression is characterized by the lack of enjoyment, isolation from friends or family, lack of motivation, failure intolerance, loss of libido, decreased or increased appetite and weight, reduced energy and early fatigue, sleep disorder, menstruation disorder, constipation, dry mouth, and headache.[5,7] In old age, depression is usually accompanied by physical symptoms such as reduced bone density, increased risk of diabetes and hypertension, or cognitive changes and may resemble dementia.[8] Factors that expose elder people to the risk of depression are different from the factors affecting people in other age groups. For example, reduced ability to carry out routine daily living activities as a result of chronic diseases, chronic or severe pain, cognitive disorder, poor income in retirement, absence of social support, and reduced satisfaction with life have a significant role in the higher prevalence of depression in this age group.[9]

Although several studies have investigated depression among cancer patients in Iran,[6,10-17] the researcher's search in databases revealed no studies on the role of the factors contributing to depression in this age group in a holistic manner (old age depression + cancer-related depression).

Given the high prevalence of depressive symptoms in elder people and their effects on their quality of life and also the differences in the factors affecting depression in elder people compared to other age groups and because the treatment of depression in elder people requires a holistic assessment in terms of comorbidities and cognitive and functional disabilities to reduce dependence on others in addition to medication regimens,[18] the present study was conducted to determine the relationship between depression symptoms and demographic-medical characteristics among elder people with cancer. An improved understanding of these factors may help promote professional health care and geriatric planning.

Methods

Setting and participants

In this cross-sectional correlational study, 200 elder outpatients and inpatients with cancer presenting to Shahid Rajaee Hospital in Babolsar, Iran, were selected through convenience sampling between June and October 2018. The present article is part of a larger study titled "the relationship between social support and depression symptoms in elder cancer patients," which has assessed 20 variables, including gender, marital status, education, income, living arrangement, frequency of contact with children, type of underlying disease, number of medications, type of cancer, stage of cancer, pain, nausea, vomiting, shortness of breath, hair loss, frequency of chemotherapy, cognitive status, Activities of Daily Living (ADL), social support status, and depression status. The present article is mainly concerned with the relationship between depressive symptoms and demographic-medical characteristics. The study inclusion criteria consisted of age over 60 years, a diagnosis of cancer for longer than 6 months,[18] and willingness to take part in the study. The exclusion criteria consisted of an Abbreviated Mental Test (AMT) score <4.[19]

The regression method used in this study meant that the sample size had to be 5–20 per each predictive variable examined.[20] This study took ten samples per variable and raised its sample size to 200.

Ethical approval

The University Ethics Committee approved the study (Approval No. IR.MAZUMS.IMAMHOSPITAL.REC.1396.50). All the participants signed written informed consent forms before participating.

Data collection procedure and tools

Afterward, the researcher briefed the candidates on the study objectives and obtained informed written consents from them and then identified the eligible patients and distributed the demographic-medical characteristics questionnaire, the Geriatric Depression Scale (GDS), the AMT, the ADL Scale, and the Multidimensional Perceived Social Support Scale among them to complete and have their data recorded.

The GDS contains 15 items, which are answered with "Yes" or "No." Scores 0–4 in this scale indicate no depression, 5–8 mild depression, 9–11 moderate, and 12–15 severe depression. The validity and reliability of the GDS were assessed in Iranian elder adults by Malakouti *et al.*, who confirmed them with a Cronbach's alpha coefficient of 0.9, cutoff point of 8, sensitivity of 0.9, and specificity of 0.84.[21]

Cognitive status was measured using the AMT.[22] In this 10-item scale, 1 score is given to each correct answer. A score ≤6 indicates the presence of cognitive impairment (0–3 indicates severe cognitive impairment, and 4–6 indicates moderate cognitive impairment). The ideal cutoff point of the Iranian version has been identified as 6, and its sensitivity and specificity were 85% and 99%.[23]

Social support was defined as a self-reported perceived social support from family, friends, or significant others and was assessed using the Multidimensional Scale of Perceived Social Support.[24] This 12-item tool is rated on a five-point Likert scale from 1 (completely agree) to 5 (completely disagree). The total score is the sum of 12 items and ranges from 12 to 60; higher total scores indicate higher levels of perceived social support. The researchers found some evidence on the reliability of this instrument, and the Cronbach's alpha values ranged from 0.85 to 0.91.[25,26] Its Cronbach's alpha was reported as 0.92 in Iran.[27]

The Katz ADL scale assesses six domains of functions (bathing, dressing, toileting, transferring, continence, and feeding). The most common method is to rate each item dichotomously (0 = less able and 1 = more able). The minimum score of this scale is zero and the maximum is 6, and a higher score indicates more independence.[28] The Cronbach's alpha of this scale was reported as 0.81 in Iran.[29]

Statistical analysis

Descriptive statistics were used to draw the table of frequency distribution and calculate the central and dispersion indices (mean and standard deviation). The findings were analyzed in SPSS software version 21.0 (Released 2012, IBM Corp, Armonk, NY, USA) using the Kruskal–Wallis and Mann–Whitney tests.

Results

The mean age of the elder people in this study was 67.82 ± 6.73 years (ranging from 60 to 92). Of the 200 participating elder people, 102 (51%) were female, 161 (80.5%) were married, 67 (33%) were illiterate, 96 (48%) had primary school to junior high school education, 28 (14%) had high school diploma, and 9 (4.5%) had university education. A total of 82 (41%) of the participants lived with their spouse and children, 72 (36%) with their spouse, 35 (17.5%) with their children, and 11 (5.5%) lived alone. A total of 135 (67.5%) were in contact with their children every day, 46 (23%) every week, 14 (7%) every month, and 5 (2.5%) had no contact. A total of 116 (58%) reported their income below their living expenses, and 84 (42%) reported it compatible with their living expenses.

The mean score of depression was 6.31 ± 2.57 in the patients. A total of 58 (29%) of them had no depression, 100 (50%) had mild depression, 37 (18.5%) had moderate, and 5 (2.5%) had severe depression.

The elder patients' depression was related significantly to their marital status (P = 0.025), living arrangement (P = 0.013), frequency of contact with their children (P = 0.050), and income (P = 0.021). The lowest depression score pertained to the single elder patients and the highest to the widowed elder patients. The lowest depression level was observed in the elder patients who lived with their spouse and children, and the highest pertained to those living with their children. The lowest depression level was observed in the elder patients who were in contact with their children every day, and the highest pertained to those with monthly contact with their children. The lowest depression level was observed in the elder patients whose income matched their expenses, and the highest pertained to those whose income was less than their living expenses. Depression had no significant relationship with gender (P = 0.520) and education (P = 0.624) in the participants [Table 1].

Patients with chronic diseases had higher depression scores. Depression had a significant relationship with diabetes (P = 0.044) and respiratory diseases (P = 0.040). The patients with respiratory problems had the highest level of depression [Table 1].

The patients with colon cancer had significantly lower depression scores than those with other cancers [P = 0.007; Table 2]. The highest level of depression was associated with hair loss and nausea and the lowest with metastasis. Depression had a significant relationship with pain, nausea, vomiting, hair loss, and shortness of breath, but no significant relationships with metastasis [Table 3].

Depression had no significant relationships with stage of the disease (P = 0.068) or the frequency of chemotherapy (P = 0.428).

Discussion

In this study, 50% of the participants had mild depression, 18.5% had moderate, and 2.5% had severe depression. The prevalence of depression among elder people with cancer was 71%, which was higher compared to the rates reported in other studies on elder people. In a study conducted by Ghanmi *et al.* in Tunisia on 60 elder cancer patients, the prevalence of depression was 48% using the GDS,[30]

Table 1: A comparison of the mean depression score in terms of the demographic variables among elder cancer patients

Gender	*n*	Mean±SD	*Z*	*P*
Female	102	6.40±2.50	−0.64	0.520
Male	98	6.21±2.65		
Total	200	6.31±2.57		
	n	Mean±SD	*K*	*P*
Marital status				
Married	6	6.67±1.03	7.40	0.025
Single	161	6.07±2.59		
Widowed	33	7.39±2.41		
Living with				
Spouse	72	6.44±2.58	10.73	0.013
Children	35	7.37±2.43		
Spouse and children	82	5.73±2.57		
Alone	11	6.36±1.89		
Frequency of contact with children				
Daily	135	5.96±2.50	7.72	0.050
Weekly	46	7.00±2.60		
Monthly	14	7.43±2.92		
No contact	5	6.20±1.09		
Education				
Illiterate	67	6.33±2.33	1.76	0.624
Primary	96	6.28±2.58		
High school	28	6.71±3.21		
University	9	5.22±1.92		
Income				
Less than expenses	116	6.66±2.54	5.34	0.021
Matching expenses	84	5.82±2.55		
Chronic disease	*n*	Mean±SD	*Z*	*P*
Diabetes				
Yes	35	7.14±2.54	−2.01	0.044
No	165	6.13±2.55		
Respiratory				
Yes	8	8.13±2.29	−2.05	0.040
No	192	6.23±2.56		
Kidney				
Yes	12	7.33±2.53	−1.45	0.147
No	188	6.24±2.56		
Heart				
Yes	48	6.92±2.53	−1.91	0.055
No	152	6.12±2.56		
Hypertension				
Yes	40	6.42±2.62	−0.42	0.674
No	160	6.26±2.55		
Gastrointestinal				
Yes	22	7.18±2.61	−1.65	0.097
No	178	6.20±2.55		
Muscular				
Yes	5	6.80±2.16	−0.59	0.549
No	195	6.30±2.58		
Skeletal				
Yes	6	7.00±1.54	−0.87	0.381
No	194	6.29±2.59		
Neurological				
Yes	13	6.69±2.05	−0.75	0.454
No	187	6.28±2.60		

SD: Standard deviation, *n*: number, K: Kruskal-Wallis

and Heidarzadeh *et al*. reported that the rate was 55% in 142 elder people with cancer in Tabriz, with 43% of the individuals having mild depression (Beck score of 11–21) and 12% had severe depression (Beck score ≥21).[13] Weiss Wiesel *et al*. used the Hospital Anxiety and Depression Scale and found the prevalence of depression in 500 elder cancer patients in the US to be 12.5%.[5] In a study conducted by Ko *et al*. in Korea on 69 cancer patients with a mean age of 64.7 years using the Beck Depression Inventory, the cutoff point for severe depression was taken as 24, and two groups with and without pain were compared; the results showed that 52.1% of those without pain and 76.2% of those with pain had severe depression.[31]

Quoting a review of 100 studies by Massie, Findley *et al*. reported the prevalence of depression among cancer patients of all age groups was 38%–58%.[32] The prevalence of depression was reported as 52.5% in 80 cancer patients with a mean age of 43.35 years in Ahwaz, Iran.[14] and it was reported as 59.5% in another study on 173 cancer patients in Isfahan, Iran (half of whom were aged 50-65 years).[6]

In the patients with specific cancer, the prevalence of depression was reported as 47.2% in a study by Bener *et al*. conducted on 678 breast cancer patients (mean age 47.7 years) in Qatar[33] and 23.4% in a study by Nikbakht *et al*. conducted on 120 patients with colorectal cancer (70% aged over 50) in Babol, Iran.[11]

The differences in the depression rates reported by the cited studies can be attributed to the different data collection tools used, cutoff points set, and characteristics of the participants, including their different comorbidities, progress of cancer, frequency of chemotherapy, incidence of complications, social support received, and ability to cope with the disease.

In the present study, no significant relationship was observed between depression and gender, which agrees with the results obtained by Weiss Wiesel *et al*., Malekian *et al*., and Noroozinejad *et al*.[5,6,14] In studies conducted by Nikbakht *et al*. and Hartung *et al*.,[11,34] the prevalence of depression was significantly higher in women. The different depression scores in women appear to be associated with higher rate of unemployment, lack of independent source of income, widow status, and greater sensitivity to stressful events.

In the present study, the widowed elder patients had the highest depression score, which agrees with the results reported by Ghanmi *et al*.[30] It seems that living with the family is associated with a greater participation in social activities and a higher self-esteem.

Although the prevalence of depression was lower in this study in the patients with university education and higher

Table 2: The mean depression score among elder cancer patients based on type of cancer

Cancer	*n*	Mean±SD	*Z*	*P*
Colon				
Yes	30	5.17±2.29	−2.68	0.007
No	170	6.51±2.57		
Esophageal				
Yes	30	6.27±2.77	−0.19	0.848
No	170	6.32±2.54		
Breast				
Yes	25	6.68±2.26	−0.85	0.395
No	175	6.26±2.61		
Prostate				
Yes	24	5.67±2.64	−1.40	0.161
No	176	6.40±2.55		
Lung				
Yes	30	7.00±2.71	−1.57	0.115
No	170	6.19±2.53		
Head and neck				
Yes	30	6.50±2.72	−0.46	0.646
No	170	6.28±2.55		
Gastric				
Yes	30	6.83±2.27	−1.33	0.182
No	170	6.22±2.61		

SD: Standard deviation

Table 3: A comparison of the mean depression score among elder cancer patients based on complications and stage of the disease

Complication	*n*	Mean±SD	*Z*	*P*
Metastasis				
Yes	53	6.28±2.76	−0.23	0.815
No	147	6.32±2.51		
Pain				
Yes	96	6.97±2.58	−3.44	0.001
No	104	5.70±2.41		
Nausea				
Yes	31	8.00±2.40	−3.90	<0.001
No	169	6.00±2.48		
Vomiting				
Yes	26	7.96±2.55	−3.31	0.001
No	174	6.06±2.49		
Hair loss				
Yes	30	8.07±2.53	−3.83	<0.001
No	170	6.00±2.45		
Shortness of breath				
Yes	45	7.11±2.81	−2.20	0.028
No	155	6.08±2.45		
Stage of the disease				
Stage two	161	6.14±2.47	−1.82	0.068
Stage three	39	7.00±2.88		

SD: Standard deviation

in the illiterate patients, depression had no significant relationship with education, which agrees with the results reported by Nikbakht *et al.* and Hartung *et al.*[11,34] In the study by Noroozinejad *et al.*, depression reduced significantly as the level of education increased;[14] however, in Mashhadi *et al.* study in the south of Iran (Zahedan), the prevalence of depression was significantly higher in patients with higher education.[17] The poor knowledge about their cancer diagnosis and its prognosis may contribute to the lower level of depression in illiterate patients. Moreover, higher education may lead to better interactions with the environment.[14] In elder people, higher education can help prepare for retirement and achieve financial security.

The lowest depression score in the present study pertained to the patients with incomes matching their expenses, and this difference was statistically significant too; however, several studies did not find this difference to be significant.[11,14] An unfavorable job and low income expose elder people to worry, stress, and depression.

In the present study, the individuals with chronic diseases had higher depression scores, and depression had a significant relationship with diabetes and respiratory diseases, which concur with the results reported by Ghanmi *et al.* and Weiss Wiesel *et al.*[5,30] In Nikbakht *et al.* study, depression was significantly higher in patients with chronic diseases.[11] Physical disorders and their related symptoms have a direct effect on mental health. Old age problems, such as cardiac diseases, chronic pulmonary diseases, and other cancers, can be effective in the development or exacerbation of depression and anxiety.

In the present study, the patients with lung cancer had the highest level of depression, and depression was found to have a significant relationship with colon cancer, as the mean depression score was lower in the patients with colon cancer compared to those with other cancers. This finding disagrees with the results reported by Hartung *et al.* conducted on 4020 patients in Germany. In their study, patients with pancreatic cancer, thyroid disorder, and cerebral tumors had the highest prevalence of depression, and those with prostate cancer and malignant melanoma had the lowest level of depression.[34] The mean age of the patients was 58 years in their study and 67.8 years in the present study. In a study conducted by Park *et al.* on 30,400 patients in South Korea, the highest prevalence of depression was in lung cancer patients and the lowest in the thyroid cancer patients. The poor prognosis of lung cancer and its increased mortality rate may have had a role in increasing the prevalence of depression in this cancer.[35] There appear to be chemicals released in cancer such as lung and pancreatic cancer that may have a role in causing depression. Depression has a relationship with certain cancer treatments, such as chemotherapy and corticosteroid therapy. Antidepressants may worsen the symptoms of cancer and interact with chemotherapy medications. Sertraline and Citalopram have the least interaction and are generally well tolerated.[36] The better prognosis and

curability of thyroid cancer may have had a role in the reduced prevalence of depression in this cancer. A higher percentage of women with colorectal, gastric, and thyroid cancer had depression. The total mean age of the patients was 58.1 years, however, the mean age was 66.3 years in patients with prostate cancer, and 65 years in those with lung and bladder cancer.[35]

In the present study, no significant relationships were observed between the severity of depression and the frequency of chemotherapy sessions; however, this relationship was significant in Noroozinejad *et al*. study.[14] Cancer treatment appears to reduce the level of depression, but a prolonged therapy period and its complications tend to cause depression in patients. Psychosocial factors such as social support, coping mechanisms, and the patient's ability to cope with disease are likely to have caused the differences between the results of the present study and the cited studies.

Limitations

Personality traits and religious differences among the participants were not taken into consideration in this study.

Conclusion

Given the results obtained, the frequency of depression was higher in elder people with cancer compared to patients from other age groups, and this condition may affect the disease progression, quality of life, and survival. Screening and counseling-supportive interventions can be effective in preventing depression and helping elder patients cope with their cancer.

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Conflicts of interest

There are no conflicts of interest.

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