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

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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.[5,6] 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.[6] 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,[7] 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.[6] 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]
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). 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%. 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.

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%. The prevalence of depression was reported as 52.5% in 80 cancer patients with a mean age of 43.35 years in Ahwaz, Iran, 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).

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 and 23.4% in a study by Nikbakht et al. conducted on 120 patients with colorectal cancer (70% aged over 50) in Babol, Iran.

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. In studies conducted by Nikbakht et al. and Hartung et al., 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. 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 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  |       |     |

| Marital status  | n   | Mean±SD | K   | P   |
|-----------------|-----|---------|-----|-----|
| Married         | 6   | 6.67±1.03 | 7.40 | 0.025 |
| Single          | 161 | 6.07±2.59 |       |     |
| Widowed         | 33  | 7.39±2.41 |       |     |

| Living with     | n   | Mean±SD | Z   | P   |
|-----------------|-----|---------|-----|-----|
| 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 | n   | Mean±SD | Z   | P   |
|-----------------------------------|-----|---------|-----|-----|
| 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        | n   | Mean±SD | Z   | P   |
|-----------------|-----|---------|-----|-----|
| 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          | n   | Mean±SD | Z   | P   |
|-----------------|-----|---------|-----|-----|
| 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        | 35  | 7.14±2.54 | −2.01 | 0.044 |
| No              | 165 | 6.13±2.55 |       |     |
| Respiratory     | 8   | 8.13±2.29 | −2.05 | 0.040 |
| No              | 192 | 6.23±2.56 |       |     |
| Kidney          | 12  | 7.33±2.53 | −1.45 | 0.147 |
| No              | 188 | 6.24±2.56 |       |     |
| Heart           | 48  | 6.92±2.53 | −1.91 | 0.055 |
| No              | 152 | 6.12±2.56 |       |     |
| Hypertension    | 40  | 6.42±2.62 | −0.42 | 0.674 |
| No              | 160 | 6.26±2.55 |       |     |
| Gastrointestinal | 22 | 7.18±2.61 | −1.65 | 0.097 |
| No              | 178 | 6.20±2.55 |       |     |
| Muscular        | 5   | 6.80±2.16 | −0.59 | 0.549 |
| No              | 195 | 6.30±2.58 |       |     |
| Skeletal        | 6   | 7.00±1.54 | −0.87 | 0.381 |
| No              | 194 | 6.29±2.59 |       |     |
| Neurological    | 13  | 6.69±2.05 | −0.75 | 0.454 |
| No              | 187 | 6.28±2.60 |       |     |

SD: Standard deviation, n: number, K: Kruskal-Wallis.
Ladaninejad, et al.: Depressive Symptoms among Elder People with Cancer

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

| Cancer      | Yes  | No    | Mean±SD          | Z     | P     |
|-------------|------|-------|------------------|-------|-------|
| Colon       | 30   | 170   | 5.17±2.29        | −2.68 | 0.007 |
| Esophageal  | 30   | 170   | 6.27±2.77        | −0.19 | 0.848 |
| Breast      | 25   | 175   | 6.68±2.26        | −0.85 | 0.395 |
| Prostate    | 24   | 176   | 5.67±2.64        | −1.40 | 0.161 |
| Lung        | 30   | 170   | 7.00±2.71        | −1.57 | 0.115 |
| Head and neck| 30   | 170   | 6.50±2.72        | −0.46 | 0.646 |
| Gastric     | 30   | 170   | 6.83±2.27        | −1.33 | 0.182 |

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         | Yes  | No    | Mean±SD          | Z     | P     |
|----------------------|------|-------|------------------|-------|-------|
| Metastasis           | 53   | 147   | 6.28±2.76        | −0.23 | 0.815 |
| Pain                 | 96   | 104   | 6.97±2.58        | −3.44 | 0.001 |
| Nausea               | 31   | 169   | 8.00±2.40        | −3.90 | <0.001|
| Vomiting             | 26   | 174   | 7.96±2.55        | −3.31 | 0.001 |
| Hair loss            | 30   | 170   | 8.07±2.53        | −3.83 | <0.001|
| Shortness of breath  | 45   | 155   | 7.11±2.81        | −2.20 | 0.028 |
| Stage of the disease |       |       |                  |       |       |
| Stage two            | 161  | 39    | 6.14±2.47        | −1.82 | 0.068 |
| Stage three          | 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.[11,14] 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.[56] 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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