



Psychiatric Symptoms in Oncological Patients at Nuclear Medicine Department

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Abstract

BACKGROUND: In the process of positron emission tomography-computed tomography scanning, patients go through a general evaluation while their medical history is being taken, but it is often overlooked that these patients should be evaluated not only biologically but also bio psychosocially.

AIM: Psychiatric symptom profiles and help-seeking behaviors of cancer patients were examined in this study.

MATERIALS AND METHODS: Cancer patients presented to the nuclear medicine clinic filled out sociodemographic data form, psychiatric admission evaluation form, Beck Anxiety Inventory (BAI), Beck's Depression Inventory (BDI), and symptom checklist-90 form for psychiatric symptom screening.

RESULTS: In this study, 27.8% of the patients had a beck depression score ≥ 18 and were in the risk group for depression, 31.7% of the patients experienced moderate or severe anxiety symptoms. Beck's depression total and Beck's anxiety total values were found significantly higher in women than in men. Only 10.2% of the cancer patients reported that they sought psychiatric help in the past 6 months. Among the patients who were risky for depression according to BDI only 25% had been receiving psychiatric help, and in among the patients who were risky for anxiety according to BAI only 26.9% had been receiving psychiatric help.

CONCLUSION: Nuclear Medicine physicians' interest in psychiatric symptoms and help-seeking behaviors of cancer patients referred to Nuclear Medicine Clinics is very important in terms of psycho-oncology.

Edited by: Sinisa Stojanovski
Citation: İlce HT, Vargol SE, Halis H, Yazici E. Psychiatric Symptoms in Oncological Patients at Nuclear Medicine Department. Open Access Maced J Med Sci. 2022 Mar 21; 10(A):734-739. <https://doi.org/10.3889/oamjms.2022.8832>
Keywords: Depression; Anxiety; Fluoro-2-deoxy-d-glucose positron emission tomography-computed tomography; Oncology
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Received: 31-Jan-2022
Revised: 06-Mar-2022
Accepted: 11-Mar-2022
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Funding: This research did not receive any financial
Competing Interests: The authors have declared that no competing interests exist
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Introduction

Cancer patients experience psychosocial changes and face a high risk of anxiety and stress. According to the previous research, anxiety and depression symptoms are more common in oncological patients at the time of diagnosis, after diagnosis, and during the treatment process than in the normal population. A meta-analysis found rates of depression and anxiety in cancer patients of 20% and 10%, respectively [1]. Two-thirds of patients with cancer and depression also have clinically significant anxiety symptoms [2].

However, individuals with psychiatric symptoms often have difficulty seeking help, and there is a performance gap in applying and accessing the effectiveness of psychiatric treatment. The possibility that anxiety and depression symptoms may increase during cancer diagnosis has been investigated before; however, the psychiatric application status of these patients has not been documented sufficiently. Only 0.5%–3% of these patients are referred to psychiatry

clinics, and anxiety and depression symptoms are often ignored in oncological patients [3].

In patients undergoing oncological follow-up, anxiety disorders and depression cause long-term negative effects on the person's acceptance of treatment and the course of the disease. In cancer patients experiencing anxiety and depression, susceptibility to severe symptoms, prolonged recovery, poor prognosis, and increased costs on the health-care system are also important issues [4]. In addition, depressed patients have a higher mortality rate than non-depressed patients [5]. Treating psychiatric problems in patients with cancer may improve not only their quality of life and prognosis but also their survival [6].

Nuclear medicine is important in the management of oncological patients. 2-(18F) Fluoro-2-deoxy-d-glucose positron emission tomography-computed tomography (FDG PET/CT) has become a widely used method in oncological patients. FDG PET/CT is a minimally invasive method for cancer patients and is a sensitive, useful molecular imaging modality in the diagnosis, staging, restaging, and prognostic evaluation of cancer [7].

Considering the psychiatric needs of these patients and the lack of help-seeking behavior in psychiatric patients, each contact with the physician during the oncological follow-up process is an important step in identifying and addressing psychiatric symptoms.

Thus, the nuclear medicine department is a suitable setting for evaluating patients facing psychiatric challenges. However, the psychiatric symptom profiles and help-seeking behaviors of oncological patients referred to Nuclear Medicine are not well documented.

This study tested the hypothesis that the psychiatric symptoms of the patients will be frequent in oncological patients, but their help-seeking behaviors will be low. This study examined a heterogeneous group of oncological patients referred to a Nuclear Medicine Clinic for FDG PET/CT, with the goal of analyzing their psychiatric symptom profiles, help-seeking behaviors, and knowledge of their disease.

Materials and Methods

Methods

Oncological patients who presented to Sakarya University Training and Research Hospital Nuclear Medicine Clinic for PET/CT scans were evaluated using a sociodemographic characteristic questionnaire, a psychiatric application evaluation form for oncological patients, the Beck Anxiety Inventory (BAI), the Beck's Depression Inventory (BDI) and the Turkish Psychiatric Symptom Screening form of symptom checklist 90 (SCL-90). The questionnaires were administered to the patients under observation. All participants were volunteers and provided informed consent. Approval for the study was obtained from the local ethics committee.

Patients with a known organic or mental illness (such as a primary brain tumor, a brain metastasis, mental retardation, or an organic brain syndrome) that would adversely affect the accuracy of the answers given in the interview were not included in the study; following Institutional Review Board approval (by Sakarya University Faculty of Medicine Research Ethics Committee with the reference number 16214662/050.01.04/68) 150 consecutive volunteer patients who applied for PET/CT imaging and met the inclusion criteria were included in the study, and the data of 98 patients who provided 80% of the requested data were processed. The scores are given by valid percent to avoid confusion.

Materials

Sociodemographic and clinical data form

This form was prepared by the researcher for the patients, taking into account the aims of the study.

To obtain the sociodemographic information of the participants, a detailed questionnaire was used, including questions about the patient's age, gender, educational status, marital status, psychiatric treatment history, and drug use.

Beck Anxiety Inventory

This scale is used for measuring levels of anxiety symptoms of the patients. BAI is first developed by Beck *et al.*, consists of 21 questions. Each question is scored between 0 (none) and 3 (seriously). High scores indicate severe anxiety. The total score that can be obtained from this scale varies between 0 and 63 [8]. It was first translated into Turkish by Nesrin Şahin and ve Durak [9], and its validity and reliability study was carried out by Ulusoy *et al.* [10].

However, according to the BAI, the anxiety levels of the patients are categorized as follows: 0–7 points are classified as low, 8–15 points as mild, 16–25 points as moderate, and 26–63 points as high anxiety.

Beck Depression Inventory

This scale is used for measuring levels of depression symptoms of the patients. The BDI was developed to evaluate depression symptom severity. This scale consists of 21 questions, and each question is graded between 0 (none) and 3 (seriously). Scores from 0 to 9 indicate no or minimal depression; scores from 10 to 18 indicate mild-to-moderate depression; scores from 19 to 29 indicate moderate-to-severe depression; and scores from 30 to 63 indicate severe depression. The total score that can be obtained from this scale ranges between 0 and 63 [11]. Beck *et al.* [12] developed the scale, and the Turkish standardization of the scale was carried out by Hisli [13].

Symptom Checklist 90 Revised

This scale is used for screening for commonly seen psychiatric symptoms of patients. This checklist was first developed by Derogatis to determine the severity and nature of mental symptoms [14]. The Turkish validity and reliability study of this scale was conducted by Dag [15]. The scale, which consists of 90 items, is a self-assessment symptom screening scale that measures the individual's level of distress in terms of general psychopathology and the severity of mental symptoms. The scale is a Likert type, and its items are scored between 0 and 4. The scale evaluates 10 different dimensions: somatization, obsessive–compulsive characteristics, sensitivity in interpersonal relationships, depression, anxiety, anger and hostility, phobic anxiety, paranoid thinking, psychotic symptoms, and additional scales. A general symptom level score above 1.00 indicates the presence of a psychopathological condition.

Application

The patients who presented to the Department of Nuclear Medicine were taken to a quiet resting room and provided with a preliminary interview describing the study. The sociodemographic and clinical data form, BAI, BDI, and SCL-90 R were then applied to patients accepted to participate in the study. All of the scales were clearly described to the patients how to fulfill and then the scales were given to the patients to fill up. During the questionnaire process, the patient had the opportunity to reach the doctor to ask questions when needed.

Statistical analysis

Data analysis was carried out using the SPSS 21.0 package program. Differences between groups in terms of frequencies of categorical data were analyzed using the chi-square test. Student's t-test was used to obtain the mean values of the measurable variables that fit the normal distribution, and the Mann–Whitney U test was used for those that did not fit the normal distribution. The mean score differences between groups were compared. The independent sample t-test was used to compare the means of the two groups, and the analysis of variance with a normal distribution was used to compare the means of more than two groups; the Kruskal–Wallis test was used in cases of non-normal distribution. When a difference was found between group averages, the Bonferroni test was used as a form of *post hoc* analysis to determine from which group or groups this difference emerged. For correlation analysis, in the case of normal distribution, Pearson correlation analysis was used, and in cases of non-normal distribution, the Spearman test was used.

The level of significance was set at 0.05, and there was said to be a significant difference between groups when $p < 0.05$.

Results

Sociodemographic features

Ninety-eight patients undergoing cancer treatment participated in this study. Fifty-two per cent of the patients participating in this study were male, 48% were female (47 women and 51 men), and their average age was 55.58 years. The sociodemographic data of the patients are summarized in Table 1.

Psychiatric symptom profile

In the analysis, the BDI scores of the patients had a mean of 13.09 ± 9.63 (range: 0–38); 27.8% of them had a beck depression scale score ≥ 18 and were in the risk group for depression. The beck anxiety scores

Table 1: Sociodemographic and clinical characteristics of the participants

Sociodemographic information	Ranges, mean, median scores	
Age (years), mean (range)	55.58 \pm 12.93 (18–78)	
Gender (%)		
Male	52	
Female	48	
Marital status (%)		
Single	15.3	
Married	84.7	
Working status	Working: 49%	Non-working: 51%
Education level (%)		
Primary school or lower	55.1	
Middle school	22.4	
High school	17.3	
University	5.1	
Duration of education (years), mean (range)	6.81 \pm 3.11 (0–15)	
Birthplace (%)	Sakarya: 58.4	Other: 41.6
Living place (%)	Rural: 31.1	Urban: 68.9
Information on patients' PET/CT imaging process		
Purpose of PET/CT (%)		
Diagnosis: 4.1		
Staging: 25.5		
Treatment response: 66.3		
Other: 1.1		
Head and neck: 4.1		
Lung: 17.3		
Breast: 17.3		
Gastrointestinal: 19.4		
Haematological: 15.3		
Genitourinary: 12.2		
Other: 14.3		
Total: 100.0		
Duration of illness (months), mean (range)	22.81 \pm 27.95 (0.5–24)	

PET/CT: Positron emission tomography-computed tomography.

were as follows: min: 0, max: 44, mean: 33.60 ± 13.14 . According to this scoring, 21.2% of the patients had mild anxiety, 12.9% had moderate anxiety, and 18.8% had severe anxiety. Therefore, 31.7% of the patients had moderate or severe anxiety symptoms.

According to the SCL-90 scores, 26.7% of the study participants were at risk of psychiatric illness. The Beck Anxiety, Beck Depression, and SCL-90 scores of the patients are presented in Table 2.

The psychiatric symptom profiles according to cancer type are presented in Table 3.

Psychiatric treatment and information related to help-seeking

The researchers investigated whether the patients had received psychiatric treatment before, what kind of psychiatric experiences they had after the oncological diagnosis and treatment process, and their help-seeking behaviors. Only 10.2% of the patients reported that they sought help in the past 6 months. Among the patients who were risky for depression according to BDI only 25% had been receiving psychiatric help, and in among the patients who were risky for moderate and severe anxiety according to BAI only 26.9% had been receiving psychiatric help.

These data are presented in Table 4.

Psychiatric symptoms and factors associated with help-seeking

Relationship with sociodemographic and oncological data

When groups were divided according to psychiatric scores, there were no significant differences

Table 2: Psychiatric symptom profiles of the patients

Psychiatric Scales and Subscales	Whole sample	Female	Male	Significance (p)	Threshold value above n percent** (%)
Beck_Depression_Total	13.09 ± 9.63	15.05 ± 9.58	10.91 ± 9.35	0.033	27.8
Beck_Anxiety_Total	33.60 ± 13.14	39.41 ± 14.18	28.67 ± 9.92	0.001	31.7 moderate-severe
Symptom Checklist Somatisation	1.04 ± 0.83	1.29 ± 0.83	0.81 ± 0.76	0.005	40.5
Symptom Checklist Obsessive-Compulsive	0.81 ± 0.74	0.98 ± 0.79	0.66 ± 0.66	0.046	35.3
Symptom Checklist Interpersonal Sensitivity (INT)	0.70 ± 0.78	0.85 ± 0.92	0.56 ± 0.60	0.194	24.4
Symptom Checklist Depression	0.86 ± 0.76	1.12 ± 0.85	0.63 ± 0.60	0.007	37.3
Symptom Checklist Anxiety	0.70 ± 0.79	0.89 ± 0.90	0.51 ± 0.62	0.088	28.2
Symptom Checklist Hostility	0.72 ± 0.76	0.80 ± 0.81	0.65 ± 0.71	0.358	27.9
Symptom Checklist Phobic Anxiety	0.36 ± 0.53	0.50 ± 0.63	0.24 ± 0.39	0.058	14.0
Symptom Checklist Paranoid Ideation	0.56 ± 0.63	0.61 ± 0.63	0.53 ± 0.63	0.398	20.2
Symptom Checklist Psychoticism	0.41 ± 0.52	0.54 ± 0.63	0.31 ± 0.37	0.070	10.7
Symptom Checklist Additional Items	1.07 ± 0.79	1.31 ± 0.81	0.85 ± 0.71	0.005	43.5
Symptom Checklist Total Score	0.75 ± 0.64	0.90 ± 0.73	0.62 ± 0.52	0.112	26.7

*Student's t-test was used because the data were normally distributed, and the Mann-Whitney U-test was used because the others were not normally distributed, **For SCL90, any score above 1 is considered to indicate a high symptom level. Those with a Beck depression score ≥ 18 and a Beck anxiety score ≥ 16 are classified as moderate-severe. SCL90: Symptom Checklist-90.

between the groups in terms of marital status, place of birth, or place of residence.

Table 3: Percentages of depression, moderate-severe anxiety and symptom checklist-90 high score of patients according to cancer types

Cancer type	Depression %	Moderate or severe anxiety %	SCL 90 high score %
Head and neck cancer	33.3	0	25
Lung cancer	27.3	31.3	33.3
Breast cancer	30.8	57.2	38.5
Gastrointestinal cancer	30.8	23.5	14.3
Haematological cancer	23.1	30.8	36.4
Genitourinary cancer	25	27.3	0
Others	28.6	32.5	25.8

SCL90: Symptom Checklist-90.

When the psychiatric scores of the patients were evaluated according to gender, the beck depression total and beck anxiety total values were found to be significantly higher in women than in men (p = 0.033 and p = 0.001, respectively). In addition, when the SCL was evaluated, it was found that SCL90-SOM, SCL90-OC, SCL90-DEP, and SCL90-AI values were significantly higher in women than in men (p < 0.005) (Table 2).

Table 4: Seeking psychiatric help and treatment rates of patients

Statement	Yes (%)	No (%)
Lifelong psychiatric treatment		
Seeking psychiatric help	24.5	75.5
Psychiatric medication	23.5	76.5
Psychotherapy	1	99
Hospitalisation	1	99
Psychiatric treatment in the last 6 months		
Seeking psychiatric help	10.2	89.8
Psychiatric medication	13.3	86.7
Psychotherapy	0	100
Hospitalisation	0	100
Psychiatric treatment at the moment		
Seeking psychiatric help	12.4	87.6
Psychiatric medication	11.3	88.7
Psychotherapy	0	100
Hospitalisation	0	100
Psychiatric treatment after cancer diagnosis		
Seeking psychiatric help	13.4	86.6
Psychiatric medication	12.4	87.6
Psychotherapy	1	99
Hospitalisation	0	100
Opinions about psychiatric help		
How many patients believe they need psychiatric help?	28.1	71.9
How many patients are considering getting psychiatric help?	24.7	75.3
How many of those who say they need help think of getting help? (n = 27)	74.1	25.9
Depression risk group		
How many patients believe they need help?	65	35
How many patients are considering getting psychiatric help?	55	45
How many patients are receiving psychiatric help?	25	75
How many patients have received lifelong psychiatric help?	55	45
Anxiety risk group		
How many patients believe they need psychiatric help?	66.7	33.3
How many patients are considering getting psychiatric help?	48.1	51.9
How many patients are receiving psychiatric help?	26.9	51.9
How many patients have received lifelong psychiatric help?	48.1	73.1

Relationship with education level

A significant negative correlation was found between the education level of the patients and beck depression, beck anxiety, and SCL-90 additional medical disease scores. For depression and education r = -0.267, p = 0.024; for anxiety and education r = -0.282, p = 0.09; for SCL-90 additional medical disease scores and education r = -0.227, p = 0.037.

There were no significant relationships between the reason for PET-CT imaging, duration of illness, age, and psychiatric symptoms.

Discussion

This study investigated the relationship between psychiatric symptom profiles and help-seeking behavior among oncological patients referred to a Nuclear Medicine Clinic for FDG PET/CT imaging.

In this study, patients in the risk group for depression and anxiety were identified, and 27.3% of the patients were found to be in the depression risk group according to BDI. Of these patients, 65% were aware of their need for psychiatric help, and 35% of them did not believe that they needed psychiatric help. Of those in the depression risk group, 45% did not think of getting help, and 75% of them did not get any help. These rates demonstrate the inadequacy of the psychiatric help obtained by cancer patients at risk for depression. This treatment gap is increasing worldwide for psychiatric disorders and a bridge is needed as psycho-oncology to provide support for patients who have both mental health problems and cancer [16], [17]. A broad review of the worldwide literature reveals that 73% of patients with depression do not receive treatment for their mental health [18], which is a figure similar to ours.

Of the patients evaluated in this study, 24.5% received lifelong psychiatric help, and 75.5% did not. Of these patients, 23.5% received medication. Worldwide, most people with mental illnesses receive no treatment [19]. In addition, 73% of depressed cancer patients do not receive effective psychiatric treatment, and only 5% see a mental health professional [20]. In

this study, only 1% of the patients received inpatient treatment.

As presented in Table 4, 13.3% of the patients had received psychiatric medication for the last 6 months, and only 11.3% were currently receiving psychiatric medication although over 25% of them were in high risk for anxiety or depression. When the patients were asked whether they needed psychiatric help, 28% stated that they needed psychiatric help but of those who said they needed help 25.9% stated that they were not considering seeking psychiatric help. Although psychotherapy is accepted as an important part of psychiatric support in cancer patients worldwide [21], it is noteworthy that none of the participants in this study had ever received psychotherapy.

Anxiety disorders are one of the medical conditions that cancer patients face that cause increase burden of disease and also loss in functionality and quality of life [22]. In this study, it was determined that 48% of patients in the moderate-severe anxiety group had thought of getting help. Of these patients, 66.7% were aware of their need for help, whereas 33.3% were not. Moreover, only 26.9% of these patients with a high risk of moderate-severe anxiety according to BAI were currently receiving psychiatric treatment. This rate of awareness about the need for psychiatric treatment was found to be quite low in the group with moderate to severe anxiety symptoms, which indicates that we should carefully examine the obstacles to psychiatric treatment in this patient group.

Female patients and patients with low education levels were found to be at greater risk of psychiatric symptoms in this study. In fact, this situation reflects the risky group in terms of psychiatric diseases in the literature [23]. The results about the relationship between psychiatric symptoms, gender, and education levels in this study underline the importance of the careful evaluation of oncological patients who present for PET/CT, especially women and those with a low level of education. Considering that low education level poses a risk for depression, there may be an especially high risk for depression in older women, and care should be taken with this population due to this correlation.

In the correlation analysis performed for the sociodemographic data of the sample, low education level was correlated with high age. It is hard to say a direct correlation between age and depression when the literature evaluated. Its previously documented that depression is more likely to be seen among younger and more socially disadvantaged individuals [18]. Age is also reported as a predictive factor for depression by Di Giacomo *et al.*, who analyzed a sample of 82 women in Italy and concluded that young patients seem more emotionally resilient [24].

In this study, no significant relationship was found between the reason for PET-CT imaging and psychiatric symptoms. However, such a relationship

was found in other studies [25], [26], [27], and we believe that this difference may have been caused by the small size of our sample. Repeating this study with a larger sample may yield more meaningful results.

In the process of PET/CT scanning, patients go through a general evaluation while their medical history is being taken, but as in other clinics working with cancer, it may be often overlooked that these patients should be evaluated not only biologically but also bio-psychosocially [17]. When patients present to a Nuclear Medicine Clinic, they may have the opportunity to talk to a physician, but evaluating and addressing their psychiatric status is not among the topics on the agenda of Nuclear Medicine physicians. In fact, the multidisciplinary study model proposed by the WHO and targeted in our country recommends evaluating the patient as a biopsychosocial whole to be handled multidimensionally by the physician at all times [17].

Thus, we think that this study illuminates the importance of the role of nuclear medicine physicians in recognizing and addressing psychiatric symptoms in oncological patients. While nuclear medicine physicians are obtaining the histories of cancer patients presenting for FDG PET/CT imaging, it is important for them to investigate and provide guidance surrounding psychiatric symptoms and help-seeking in these patients.

Study strengths

Although the frequency of anxiety and depression in cancer patients is known, the symptom profile of the patients referred to Nuclear Medicine Clinics has not been well studied. This study is important in terms of documenting the needs and the symptom profiles of oncological patients who applied to our Nuclear Medicine Clinic for PET/CT imaging.

Study limitations

The small sample size of our study appears to be a limitation. Therefore, it is recommended that this study be repeated with a larger sample. In addition, there was no opportunity for one-on-one, face-to-face psychiatric evaluations or interviews with the patients. Although this is a limitation because this study aimed to reveal the importance of screening by Nuclear Medicine physicians, the study's methodology is compatible with the purpose of the study.

Conclusion

Patients who refer to the process of PET/CT scanning has high rates of anxiety and depression but help seeking behavior is low. Nuclear Medicine physicians

may have the opportunity to evaluate the need for psychiatric help and encourage patients for help-seeking.

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