

Assessing anxiety, depression, and stress among inpatients with cancer*

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Abstract

Objective This study aimed to assess anxiety, depression, and stress among inpatients with cancer.

Methods Two hundred thirty-five hospitalized patients with cancer were surveyed with the Depression Anxiety Stress Scales (simplified Chinese Version). The software program SPSS 25.0 was used for statistical analysis of the survey data.

Results The average scores of depression, anxiety, and stress of inpatients with cancer were 12.17, 11.84, and 13.98 respectively, which were higher than the normal range. The scores of anxiety and stress of inpatients with different caregivers were statistically different ($P = 0.024/0.036$). The anxiety and stress scores of inpatients with spouses as caregivers were higher than those of inpatients with children as caregivers. There was a statistically significant difference in the incidence of stress between inpatients with cancer with religious beliefs and inpatients with cancer without religious beliefs ($P = 0.026$), and those with religious beliefs had greater incidence of stress. The score of anxiety was significantly higher for inpatients with children than for inpatients without children ($P = 0.040$).

Conclusion The anxiety, depression, and stress levels of inpatients with cancer are relatively high. It is necessary to pay special attention to the psychological status of these patients during clinical diagnosis and treatment to improve their quality of life.

Key words: inpatients with cancer; anxiety; depression; stress

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Cancer is the second leading cause of death globally, and was responsible for an estimated 9.6 million deaths in 2018. Globally, about one in six deaths is due to cancer. Cancer affects not only physiological function but also mental health^[1–2]. However, psychological factors can also affect the occurrence and development of the physical disease^[3]. Anxiety and depression are highly prevalent in patients with cancer. They are caused by factors such as pain, fatigue, social loneliness, interpersonal relationship disorders, fear of tumor recurrence, and

death. The inability to continue to assume social roles and the economic problems caused by treatment also place patients with cancer at a high risk for stress. These mental health problems may affect the ability of patients to cope with cancer and have a negative impact on the effectiveness of treatment. This study aimed to assess anxiety, depression, and stress among inpatients with cancer and to explore related factors. The findings of this study can provide a better and more comprehensive understanding of the psychological status of patients with

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cancer and inform future psychological interventions.

Materials and methods

Participants

The participants were 235 patients with cancer treated in the inpatient department of Tongji Hospital (affiliated with Huazhong University of Science and Technology and the First Affiliated Hospital of Nanjing Medical University) from October 2019 to November 2019.

Inclusion criteria were as follows: (1) Inpatients diagnosed with cancer by pathology/cytology, clinical, and imaging studies; (2) Aged 18 years or over; (3) Able and willing to participate; (4) Survival period $\geq$ 3 months.

Exclusion criteria were as follows: (1) Those who were unable to complete the study due to illness and (2) Those with cognitive impairment or a history of mental illness.

Research tools

(1) A demographic characteristics questionnaire was specifically developed for the study. The questionnaire was used to collect data on age, gender, occupation, marital status, parental status, economic status, religious beliefs, and more. (2) A disease status questionnaire was also developed for the study and was used to collect data on the main period of illness, caregivers, diagnosis of diseases, treatment type, etc. The Depression Anxiety Stress Scales (DASS-21) (simplified Chinese version) was used to measure depression, anxiety, and stress. The DASS-21 consists of 21 items, which are divided into 3 subscales: depression, anxiety, and stress. Each subscale consists of 7 items. Responses are based on a 4-point scale (from 0 to 3 points, 0 = "Did not apply to me at all," 1 = "Applied to me to some degree, or some of the time," 2 = "Applied to me to a considerable degree or a good part of the time, and" 3 = "Applied to me very much or most of the time"). A higher score indicates a higher level of anxiety, depression, or stress. Recommended cut-off scores for conventional categories of severity (normal, moderate, severe) are presented in Table 1.

Test procedures and ethical considerations

Testers who had undergone training to standardize the test procedures explained the study's purpose and procedure to the patients. After informed consent

was obtained from a patient, the patient filled out the questionnaire, which was collected by the testers.

Statistical methods

The software program SPSS 25.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis of the data. Descriptive statistics were used to analyze the general characteristics of the patients. The independent sample *t* test and chi-square test were used to determine whether the binary variables (sex, religion, children, and hospital admissions) affected the patient's questionnaire scores and indicators were normal. Univariate analysis of variance and the chi-square test were used to analyze the effect of disordered variables (marital status, caregivers, knowledge level, and diagnosis type) on the questionnaire scores and indicators. The Kruskal-Wallis H test was used to determine the impact of economic status on stress, depression, and anxiety levels.

Results

Demographic characteristics of the participants

A total of 235 questionnaires were returned, of which 232 were found to be valid. Of all the respondents, 132 (56.9%) were male and 100 (43.1%) were female. The patients' ages ranged from 22 to 83 years. With regard to marital status, 6 (2.6%) were unmarried, 217 (93.5%) were married, 2 (0.9%) were divorced, and 7 (3.0%) were widowed. Two hundred twenty-five (97.0%) had children and 7 (3.0%) had no children. One hundred forty-two (61.2%) were provided care by their spouses, 65 (28.0%) by their children, 2 (0.9%) by a nursing assistant, and 23 (9.9%) by other individuals. With regard to occupational status, 33 (14.2%) were farmers, 32 (13.8%) were non-agricultural workers, and 28 (12.1%) were unemployed. In terms of family income, 89 (38.4%) patients had annual family incomes below 50,000 yuan, 89 (38.4%) between 50,000 and 100,000 yuan, 36 (15.5%) between 100,000 and 200,000 yuan, 12 (5.2%) between 200,000 and 300,000 yuan, and 6 (2.6%) with incomes of over 300,000 yuan. In terms of religious beliefs, 18 (7.8%) patients practiced Buddhism, 4 (1.7%) practiced Christianity, 3 (1.3%) practiced a religion besides Buddhism or Christianity, and 207 (89.2%) held no religious beliefs. Twenty-eight people (12.1%) knew nothing about the diagnosis and treatment plan of the current disease, 160 (69%) had some knowledge, and 44 (19.0%) had a high level of knowledge. With regard to cancer type, 131 (56.5%) patients were diagnosed with lung cancer, 13 (5.6%) with esophageal cancer, 5 (2.2%) with pancreatic cancer, and 83 with other cancers. Forty-four (19.0%) were hospitalized for the first time, and 188 (81.0%) were admitted for the second time or more.

Table 1 Cut-off scores of DASS-21

	Depression	Anxiety	Stress
Normal	0–9	0–7	0–14
Mild	10–13	8–9	15–18
Moderate	14–20	10–14	19–25
Severe	21–27	15–19	16–33
Extremely severe	28+	20+	34+

Analysis of DASS-21 survey results

Depression, anxiety, and stress scores

The average scores of the depression, anxiety, and stress subscales of the DASS-21 were 12.17 ± 10.13 points, 11.84 ± 8.74 points, and 13.98 ± 9.74 points, respectively. The overall scores for depression and anxiety were beyond normal range, and the overall scores of the patients showed mild depression and moderate anxiety. Although the overall stress score was within normal range (0–14 points), it was close to the upper limit. Among the three subscales, 151 patients (65.1%) showed higher scores in anxiety than the normal range, 124 (53.4%) showed higher scores in depression, and 83 (35.8%) in stress (Table 2).

Analysis of DASS-21 scores by caregiver type

A one-way analysis of variance was used to compare the average scores of depression, anxiety, and stress of patients by caregiver type. The results showed that patients with different types of caregivers had statistically significant differences in anxiety and stress scores ($P < 0.05$). Then the T3 method was used for subsequent post-examination. The results showed that the score of stress of patients with spouses as caregivers (15.34 ± 10.21) was higher than that of patients with children as caregivers (11.23 ± 6.80), and the difference was statistically significant ($P = 0.005$). The anxiety score of patients with spouses as caregivers (13.20 ± 9.08) was higher than that of patients with children as caregiver (9.29 ± 6.59), and the difference was statistically significant ($P = 0.004$) (Table 3).

Differences in stress level between patients with and without religious beliefs

Stress level was further divided into two categories: normal (0–14 points) and abnormal (greater than 14 points). The chi-square test was used to analyze the differences in stress level between patients with and

without religious beliefs. No difference was found between patients with religious beliefs and non-religious beliefs in terms of normal stress levels. The Pearson chi-square value was 4.988, and the P value was 0.026, indicating that patients with religious beliefs and non-religious beliefs differ in terms of incidence of abnormal stress. Patients with religious beliefs were found to have high incidence of abnormal stress (Table 4).

Differences in anxiety level between patients with and without children

Anxiety level was further divided into two categories: normal (0–7 points) and abnormal (greater than 7 points). The chi-square test was used to analyze the differences in anxiety between patients with and without children. No difference was found between patients with and without children in terms of normal anxiety levels. The Pearson chi-square value was 4.235, and the P value was 0.040, indicating that patients with children and without children differ in terms of incidence of abnormal anxiety. Patients with children were found to have high incidence of abnormal anxiety (Table 5).

Discussion

In the research on the occurrence, progress, and prognosis of cancer, the role played by psychosocial factors has been receiving more and more attention. The treatment of cancer has also changed from simple anti-tumor drug treatment to comprehensive treatment that combines both physical and psychological approaches. The goal of treatment is mainly to improve the survival rate and improve the patient's quality of life. Studies conducted in China and abroad have confirmed that patients with cancer have different degrees of emotional disorders, and that emotional disorders can affect the rehabilitation and prognosis of patients^[4–5]. Li Jun^[6] and

Table 2 Distribution of DASS-21 in 232 cancer patients (%)

	Depression	Anxiety	Stress
Normal	108 (46.6)	81 (34.9)	149 (64.2)
Mild	31 (13.4)	21 (9.1)	26 (11.2)
Moderate	56 (24.1)	63 (27.2)	25 (10.8)
Severe	15 (6.5)	24 (10.3)	17 (7.3)
Extremely severe	22 (9.5)	43 (18.5)	15 (6.5)

Table 3 DASS-21 scores of patients with different caregivers ($\bar{x} \pm s$)

Caregiver	<i>n</i>	Depression	Anxiety	Stress
Spouse	142	13.34 ± 10.47	13.20 ± 9.08	15.34 ± 10.21
Children	65	9.42 ± 7.24	9.29 ± 6.59	11.23 ± 6.80
Nursing assistant	2	9.00 ± 12.73	10.00 ± 14.14	9.00 ± 12.73
Other	23	13.04 ± 13.46	10.78 ± 10.23	13.83 ± 12.25
<i>F</i>		2.399	3.217	2.892
<i>P</i>		0.069	0.024	0.036

Table 4 Comparison of stress status between patients with and without religious belief (Numbers of participants)

Religious Belief	Stress		Total
	Normal	Abnormal	
Without	138	69	207
With	11	14	25
Total	149	83	232

Table 5 Comparison of the anxiety level of patients with or without children (Numbers of participants)

Children	Anxiety		Total
	Normal	Abnormal	
Without	76	149	225
With	5	2	7
Total	81	151	232

others have found a positive rate of depression in patients with malignant tumors of 58.9%, a positive rate of anxiety of 28.1%, and a relatively high stress level^[7].

The DASS-21 is a short version of the DASS-42, which was originally used to investigate the depression, anxiety, and stress status of normal adults based on their experienced emotions within the past week. Previous research has demonstrated that the Chinese version of the DASS-21 is highly reliable and valid, and can effectively be used to assess levels of negative emotions^[8]. The scale is easy to use and is suitable for clinical and scientific research. In the present study, 65.1% of inpatients with cancer showed different anxiety levels, 53.4% of patients had depression beyond the normal range, and 35.8% of patients had higher stress than the general population.

The present study also showed that patients under the care of their spouses have higher levels of anxiety and stress compared with those under the care of their children ($P < 0.05$). The possible explanations for this finding are as follows: If the patient is a middle-aged or young person, their spouse will have different degrees of influence on their jobs, which will affect the family income. If there are still minors in the family who need care, anxiety and stress levels are likely to increase. If the patient is an older adult, the spouse is also likely to be an older adult. Although there is no burden of occupation due to the spouse's age, long-term and complicated care work may cause stress and anxiety in the patient and caregiver.

In addition, incidence of anxiety among patients with children was found to be higher than that among patients without children. This finding may be because patients with children worry that they cannot effectively fulfill their role as parents (e.g., properly care for their children and accompany their children) and that they may burden their children.

There is no conclusive evidence of the influence of religious beliefs on mental health of patients. Ding Zhihong^[9] has shown that religious beliefs play an important role in improving the incidence of depression in the elderly, and Peng Ling *et al*^[10] has demonstrated that there is no statistical difference in depression and anxiety between patients with cancer with and without religious beliefs. However, the differences in quality of life have been found to be statistically significant. The results of the present study showed that patients with religious beliefs have a higher incidence of abnormal stress than patients without religious beliefs. This finding may be because patients with cancer may question their religious and spiritual beliefs during their illness. However, because only 105 of the participants in the study had specific religious beliefs, future studies with larger samples may be needed.

With regard to the relationship between gender, age,

marital status, and cancer type, and the psychological status of patients, the findings are controversial. Zhang Yening^[11] showed that there are differences in psychological pain between male and female patients with cancer; female patients are more likely to suffer from mental distress. Zabora^[12] showed that unmarried patients with lung cancer have the highest rates of mental distress. The results of the present study indicated that gender, age, marital status, and cancer type are not related to patients' anxiety, depression, and stress levels. These findings are consistent with those of a Korean study conducted by Shim^[13].

With regard to the relationship between annual family income and the psychological symptoms of patients, previous studies^[14] have shown that patients with low income (low social economic status) have more severe mental problems. The present study found no significant differences in depression, anxiety, and stress between patients with different annual family incomes. This finding may be related to China's deepening of medical insurance system reform in recent years, which has led to an increase in the proportion of patients receiving reimbursement for treatment. The impact of family economic status on psychological status may have been reduced through the reforms. In addition, in the present study, anxiety, depression, and stress levels were not found to be associated with the number of hospital admissions. This finding is consistent with those of a study by Li Jun^[6].

This study had several limitations. First, because of the limited sample size, in some aspects, the comparison between groups did not show the significance of the difference. Second, because only the DASS was used, other in-depth psychological factors were not investigated. Therefore, future studies with larger sample sizes and a variety of tools should be conducted, in order to deeply explore the influencing factors of the mental health of patients with cancer.

In conclusion, this study found that among hospitalized patients with cancer, the incidence of depression, anxiety, and stress are relatively high, and for some patients, the levels are extremely high. In the clinical diagnosis and treatment of patients with cancer, attention should be paid to appropriate psychological counseling and intervention, in order to improve psychological health and quality of life among these patients.

Conflicts of interest

The authors indicated no potential conflicts of interest.

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