

## Research Article

# Analysis of Factors That Influence the Spiritual Care Needs of Patients with Advanced Cancer

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**Objective.** To explore the factors influencing the spiritual care needs of patients with advanced cancer. **Method.** A sample of 321 patients with advanced cancer, who have been treated in the Affiliated Cancer Hospital of Zhengzhou University from December 2022 to February 2023, was recruited. Clinical data of patients participating in this study were collected via a customized questionnaire. The validated Chinese version of the spiritual care needs scale was used to evaluate patients' spiritual care needs. Statistical analyses included the unpaired *t*-test, analysis of variance, and multiple linear regression. **Result.** The average score of spiritual care needs was  $33.81 \pm 7.76$  points. Multiple regression analysis revealed that age ( $t = 4.24$  and  $P < 0.01$ ), occupation ( $t = 2.971$  and  $P < 0.01$ ), and alcohol consumption ( $t = 3.477$  and  $P < 0.01$ ) significantly influenced spiritual care needs. Patients with age, occupation, and alcohol consumption negatively impact spiritual needs, that is, the older the age, the smaller the spiritual needs. Individuals who engaged in business units, individual businesses, or had a drinking habit had lower spiritual needs. **Conclusion.** The scores of spiritual care needs in patients with advanced cancer were influenced by factors such as age, occupation, and alcohol consumption.

## 1. Introduction

Cancer is mainly related to genetics, lifestyle choices (e.g., diet, physical activity, tobacco, and alcohol use), and access to healthcare [1, 2]. In recent years, given China's social and economic development, the daily life of individuals is characterized by increasing pressure to work and they suffer from increasing environmental pollution [3, 4], whereas the incidence of advanced tumors, such as liver cancer, gastric cancer, and lung cancer, is increasing year by year [2, 5, 6]. At the modern level of medicine, cancers cannot be

eradicated; they are difficult to heal, easily metastasize and recur, and the long-term survival rate is generally low [6, 7].

Patient spirituality involves a process by which patients think about life beyond the meaning of matter or the value of life when they are critically ill. Spiritual care is an indispensable care service for patients in terminal stages [8–10]. It involves the identification of spiritual needs in patients with advanced cancer as well as support in meeting those needs, which helps patients maintain an optimistic and positive psychological state in the course of illness, discover the value of life, and face the world with love and tolerance

[8]. Some studies have shown that patients with cancer have a high desire for life, religious beliefs, and forgiveness, and they strive for health and hope to get on with life, which is also a spiritual need for patients with advanced cancer [9, 11].

Recent studies have increasingly underscored the importance of spiritual nursing, highlighting its significant outcomes [8, 12, 13]. This study aims to explore the various factors influencing the spiritual care needs of patients with advanced cancer. By conducting an in-depth analysis of demographic factors, social status, occupation, and drinking habits, we intend to identify key factors that significantly impact patients' spiritual care needs. Therefore, the primary goal of this research is to provide a scientific basis for more precisely defining and meeting the specific spiritual needs of patients with advanced cancer.

## 2. Materials and Methods

**2.1. General Information.** A total of 321 patients with advanced cancer, who have been admitted to the Affiliated Cancer Hospital of Zhengzhou University from December 2022 to February 2023, were selected. This hospital is the only tertiary grade A specialized cancer hospital in Henan Province, handling approximately 660,000 outpatient visits and 180,000 hospital admissions annually. This high volume of patients provides a rich and representative group for our study [14].

**2.2. Sample Size Determination.** Our sample size was based on previous related research and statistical power analysis. Specifically, Cohen's power analysis method was utilized to estimate the required sample size to ensure the study had sufficient statistical power (80%) to detect a medium effect size ( $d = 0.5$ ).

Using the formula for sample size calculation,

$$n = \frac{(Z_{(\alpha/2)} | Z_{\beta})^2 \cdot 2 \cdot \sigma^2}{\Delta^2}, \quad (1)$$

where

- (i)  $Z_{\alpha/2}$  is the critical value for a two-tailed test (typically 1.96 for a 95% confidence level),
- (ii)  $Z_{\beta}$  is the critical value for the desired power (0.84 for 80% power),
- (iii)  $\sigma$  is the standard deviation of the outcome variable,
- (iv)  $\Delta$  is the effect size.

Based on this, at least 128 participants were needed. To accommodate potential data loss and enhance study reliability, we increased the sample size by 20%, resulting in the recruitment of at least 154 patients. However, to further strengthen our research, a total of 321 patients were eventually included.

**2.3. Inclusion and Exclusion Criteria.** All patients enrolled in this study met the following inclusion criteria: (1) absence of mental illness and normal consciousness and (2) ability to read and communicate. The exclusion criteria were (1) other

serious concurrent diseases such as hypertension and diabetes mellitus, which could complicate the management of their cancer or interfere with the study outcomes and (2) survival time that is expected to be longer than 6 months, as our study focused on identifying the factors that influence the spiritual care needs of those in more critical stages of illness.

## 3. Measures

**3.1. Clinical Questionnaire.** The clinical questionnaire, a custom tool developed by our research team, was tailored to align with the clinical treatment protocols and specific research objectives. This questionnaire was designed to collect comprehensive demographic and clinical information from participants. Collected data included the following:

- (i) Demographic details: patient's name, gender, age, height, weight, educational level, religion, marital status, and current employment status.
- (ii) Clinical information: diagnosis, stage of disease, and duration of illness. This information was accessed through the Affiliated Cancer Hospital of Zhengzhou University's electronic medical record and case system to ensure accuracy and comprehensiveness.

**3.2. Spirituality Nursing Needs Scale (SNS).** We utilized the Chinese version of the SNS to evaluate the spiritual care needs of the patients [15]. This scale, originally developed in English, has been culturally adapted for the Chinese population. The scale has demonstrated good reliability with a Cronbach's alpha of 0.88 [15]. The SNS is suitable for assessing the spiritual needs of both religious and non-religious individuals. It comprises 12 items, each rated on a 4-point scale ranging from 1 (low need) to 4 (high need). The overall scores are interpreted as follows:

- (i) 12–24 indicates mild spiritual care needs,
- (ii) 25–36 indicates moderate spiritual care needs,
- (iii) 37–48 indicates strong spiritual care needs.

**3.3. Ethics Statement.** This study was conducted in strict adherence to the ethical standards laid out in the Declaration of [16]. Our research protocol was thoroughly reviewed and approved by the Institutional Review Board (IRB) of the Affiliated Cancer Hospital of Zhengzhou University, ensuring all ethical considerations and participant welfare were prioritized. Approval number (IRB number: 2022-490-002) was granted on December 01, 2022. All participants provided informed consent prior to their inclusion in the study, after being fully briefed about the study's objectives, potential risks, and their rights to withdraw at any point without penalty.

**3.4. Data Collection.** The department engaged an investigator (prerequisites were working for 3 years or more in the specialty of oncology as a nurse or with higher medical education) to conduct a survey study including subjects who met the predefined inclusion criteria. Most questionnaires

were completed by the patients themselves; however, in certain cases, caregivers completed the questionnaires on behalf of the patients. Due to cultural and language differences, the investigator sometimes filled out the questionnaires after receiving informed consent from patients and caregivers. The investigator provided information on the study's aims and content to the patients and caregivers, who confirmed that their data would be collected and digitized. Specific information that was collected included.

**3.5. Understanding of Needs.** We used structured questionnaires and semistructured interview tools. Before starting the survey, we established trust and understanding with the patients to help them relax and open up. This involved asking about the physical and psychological distress they were currently experiencing, their distress in the current state, and how they would face and deal with it. Through in-depth communication, we aimed to help patients effectively buffer their negative emotions, allowing them to honestly fill out the questionnaire.

**3.6. Meeting Patients' Spiritual Needs.** We used a combination of informal interviews and interactions. After the survey, we conducted informal interviews and interactions to thank patients for completing the survey and inform them that the hospital's relevant departments could provide help if needed. Patients expressed a strong need for connection with their loved ones who provide emotional support. Therefore, we also communicated with their families. We asked patients about their concerns and wishes regarding the future, and what they wanted the healthcare staff and their families to do for them. The healthcare staff discussed and cooperated with their families to try to meet patients' needs and relieve their concerns or negative emotions.

**3.7. Statistical Methods.** Data were analyzed using the statistical software SPSS 26.0. Continuous data were expressed as the mean  $\pm$  SD, compared using a *t*-test, and analyzed by ANOVA for multiple comparisons among groups. Furthermore, a linear regression model was used for multivariate analysis. An alpha level of  $<0.05$  was considered for statistical significance testing.

## 4. Results

**4.1. Spiritual Care Needs of Patients with Advanced Cancer.** This survey targeted 321 patients with cancer, covering factors such as gender, age, marital status, education level, occupation, family income, religious beliefs, smoking, alcohol consumption, exercise, diagnosis, and treatment methods. Among them, the majority of patients were married men with a wide age distribution, low education level, other professions, and low-income levels. Furthermore, most patients had no religious beliefs, never consumed alcohol or smoked, and their exercise frequency was relatively low (see Table 1).

These data provide information about the demographics and lifestyle habits of patients with cancer, which can be used to develop better cancer prevention and treatment strategies. For example, understanding that most patients do not have religious beliefs can provide more support in terms of mental health.

**4.2. Single Factor Analysis of the Influence of General Demography Data and Disease-Related Data on the Spiritual Care Needs of Patients with Cancer.** An analysis of 321 patients with advanced cancer showed that the average score of spiritual care needs was  $33.81 \pm 7.76$ . Meanwhile, univariate analysis showed that the spiritual care needs of patients in public institutions and enterprise units were  $(44.26 \pm 8.30)$  and  $(42.48 \pm 10.19)$  points, respectively. The spiritual care needs scores of self-employed patients, temporary workers, and those in other professions were  $(43.00 \pm 10.44)$ ,  $(45.45 \pm 7.94)$ , and  $(39.49 \pm 10.70)$ , respectively. Those who never drank alcohol was  $(42.17 \pm 10.32)$  points, patients who drank  $<$  once a month  $(39.87 \pm 10.16)$ , 1-2 times a month  $(41.61 \pm 9.08)$ , 1-2 times a week  $(35.86 \pm 11.73)$ , and 3-4 times a week  $(36.13 \pm 8.920)$ . The score of spiritual care needs for patients with a daily drinking habit was  $(34.62 \pm 10.65)$ . The score for spiritual care needs of patients who never exercised was  $(43.14 \pm 11.14)$ , exercised  $<3$  days a week  $(42.14 \pm 9.78)$ , exercise 3-5 days a week  $(38.7 \pm 9.94)$  points, and patients who exercise 5-7 days a week  $(34.41 \pm 9.48)$  points. The score of spiritual care needs of patients with advanced lung cancer was  $(40.39 \pm 10.77)$ , those with lymphoma  $(43.3 \pm 9.834)$ , leukemia  $(37.5 \pm 9.81)$ , myeloma  $(34.62 \pm 9.95)$ , colorectal cancer  $(43.94 \pm 8.14)$ , and gastric cancer  $(42.85 \pm 9.87)$ .

The survey results showed that occupation, alcohol consumption, exercise, and types of diseases had a certain impact on the average score of spiritual care needs. The difference was statistically significant ( $P < 0.01$ ). The average score of spiritual care needs for patients who never exercised was significantly higher than that of patients who exercised 5-7 days per week. The average score of spiritual care needs for patients in public institutions was significantly higher than that of patients in other professions. The average score of spiritual care needs for patients without drinking habits was significantly higher than that of those with daily drinking habits. The spiritual needs of patients with lymphoma were significantly higher than those of other tumors. This may be due to the majority of patients with lymphoma surveyed in the questionnaire. However, the spiritual care needs of patients with different advanced cancer were not affected by gender, age, marital status, educational level, economic income, religious beliefs, smoking, disease stage, and duration of illness. Furthermore, there was no significant difference in the scores of spiritual care needs in these aspects ( $P > 0.05$ ) (see Table 2).

**4.3. Multiple Regression Results.** The factors with significant differences in the spiritual care needs of patients with late-stage cancer (age, occupation, alcohol consumption, exercise, and diagnosis) were used as independent variables. The

TABLE 1: Sociodemographic and disease-related data of patients with cancer ( $n = 321$ ).

| Variable                                | Number of individuals   | Proportion (%) |
|-----------------------------------------|-------------------------|----------------|
| Gender                                  | Male                    | 185            |
|                                         | Female                  | 136            |
| Age                                     | 18–44                   | 79             |
|                                         | 45–59                   | 122            |
|                                         | ≥60                     | 120            |
| Marital status                          | Unmarried               | 22             |
|                                         | Married                 | 276            |
|                                         | Divorced                | 9              |
|                                         | Widowed                 | 14             |
| Educational level                       | None                    | 17             |
|                                         | Primary school          | 61             |
|                                         | Junior high school      | 106            |
|                                         | Senior high school      | 75             |
|                                         | College or above        | 62             |
| Occupation                              | Institution             | 31             |
|                                         | Enterprise unit         | 29             |
|                                         | Individual              | 45             |
|                                         | Temporary               | 22             |
|                                         | Other                   | 194            |
| Per capita family monthly income (RMB*) | <3000                   | 193            |
|                                         | 3000–6000               | 108            |
|                                         | >6000                   | 20             |
| Religious belief                        | None                    | 295            |
|                                         | Buddhism                | 12             |
|                                         | Christianity            | 8              |
|                                         | Islam                   | 6              |
| Smoking                                 | Never smoked            | 195            |
|                                         | Currently smoking       | 15             |
|                                         | Quit smoking            | 111            |
| Drinking                                | Never                   | 225            |
|                                         | <Once per month         | 38             |
|                                         | Drink 1–2 times a month | 23             |
|                                         | Drink 2–3 times a week  | 14             |
|                                         | Drink 3–4 times a week  | 8              |
|                                         | Drink almost every day  | 13             |
| Exercise                                | Never exercise          | 72             |
|                                         | <3 days per week        | 109            |
|                                         | 3–5 days per week       | 54             |
|                                         | >5 days per week        | 46             |
|                                         | Unknown                 | 40             |
| Diagnosis                               | Lung cancer             | 57             |
|                                         | Lymphoma                | 103            |
|                                         | Leukemia                | 36             |
|                                         | Myeloma                 | 21             |
|                                         | Colorectal cancer       | 32             |
|                                         | Gastric cancer          | 20             |
|                                         | Other                   | 51             |
| Stage of disease                        | I                       | 2              |
|                                         | II                      | 33             |
|                                         | III                     | 50             |
|                                         | IV                      | 200            |
|                                         | Acute phase             | 36             |
| Duration of illness                     | 0–5 months              | 115            |
|                                         | 6–12 months             | 87             |
|                                         | >12 months              | 119            |

\*RMB, Renminbi.

TABLE 2: Single factor analysis of the influence of sociodemographic data and disease-related data on spiritual care needs of patients with cancer ( $n = 321$ ).

| Variable                                |                         | Number of cases | Percentage (%) | Spiritual care needs | $t/F$ value | $P$ value |
|-----------------------------------------|-------------------------|-----------------|----------------|----------------------|-------------|-----------|
| Gender                                  | Male                    | 185             | 57.6           | $40.95 \pm 10.63$    | 0.995       | 0.319     |
|                                         | Female                  | 136             | 42.4           | $41.36 \pm 10.12$    |             |           |
| Age                                     | 18~44                   | 79              | 24.6           | $45.82 \pm 8.74$     | 1.823       | 0.124     |
|                                         | 45~59                   | 122             | 38             | $40.43 \pm 10.33$    |             |           |
|                                         | $\geq 60$               | 120             | 37.4           | $38.74 \pm 10.57$    |             |           |
| Marital status                          | Unmarried               | 22              | 6.9            | $45.77 \pm 8.93$     | 0.603       | 0.189     |
|                                         | Married                 | 276             | 86             | $40.83 \pm 10.42$    |             |           |
|                                         | Divorce                 | 9               | 2.8            | $40.44 \pm 13.00$    |             |           |
|                                         | Widowed                 | 14              | 4.3            | $40.14 \pm 9.67$     |             |           |
| Educational level                       | None                    | 17              | 5.3            | $39.53 \pm 10.46$    | 1.494       | 0.204     |
|                                         | Primary school          | 61              | 19             | $38.64 \pm 11.23$    |             |           |
|                                         | Junior high school      | 106             | 33             | $41.18 \pm 10.70$    |             |           |
|                                         | Senior high school      | 75              | 23.4           | $42.55 \pm 10.61$    |             |           |
|                                         | College or above        | 62              | 19.3           | $42.19 \pm 8.43$     |             |           |
| Occupation                              | Institution             | 31              | 9.7            | $44.26 \pm 8.30$     | 3.436       | 0.009     |
|                                         | Enterprise unit         | 29              | 9              | $42.48 \pm 10.19$    |             |           |
|                                         | Individual              | 45              | 14             | $43.00 \pm 10.44$    |             |           |
|                                         | Temporary               | 22              | 6.9            | $45.45 \pm 7.94$     |             |           |
|                                         | Other                   | 194             | 60.4           | $39.49 \pm 10.70$    |             |           |
| Per capita family monthly income (RMB*) | <3000                   | 193             | 60.2           | $40.16 \pm 10.65$    | 2.368       | 0.095     |
|                                         | 3000~6000               | 108             | 33.6           | $42.29 \pm 10.04$    |             |           |
|                                         | >6000                   | 20              | 6.2            | $44.15 \pm 9.09$     |             |           |
| Religious belief                        | None                    | 295             | 91.9           | $40.98 \pm 10.40$    | 0.849       | 0.468     |
|                                         | Buddhism                | 12              | 3.7            | $43.00 \pm 10.57$    |             |           |
|                                         | Christianity            | 8               | 2.5            | $45.88 \pm 10.15$    |             |           |
|                                         | Islam                   | 6               | 1.9            | $38.33 \pm 11.00$    |             |           |
| Smoking                                 | Never smoked            | 195             | 60.7           | $41.51 \pm 10.09$    | 0.739       | 0.478     |
|                                         | Currently smoking       | 15              | 4.7            | $38.27 \pm 12.84$    |             |           |
|                                         | Quit smoking            | 111             | 34.6           | $40.84 \pm 10.63$    |             |           |
| Drinking                                | Never                   | 225             | 70.1           | $42.17 \pm 10.32$    | 2.752       | 0.019     |
|                                         | <Once per month         | 38              | 11.8           | $39.87 \pm 10.16$    |             |           |
|                                         | Drink 1-2 times a month | 23              | 7.2            | $41.61 \pm 9.08$     |             |           |
|                                         | Drink 2-3 times a week  | 14              | 4.4            | $35.86 \pm 11.73$    |             |           |
|                                         | Drink 3-4 times a week  | 8               | 2.5            | $36.13 \pm 8.920$    |             |           |
|                                         | Drink almost every day  | 13              | 4              | $34.62 \pm 10.65$    |             |           |
| Exercise                                | Never exercise          | 72              | 22.4           | $43.14 \pm 11.14$    | 9.273       | <0.001    |
|                                         | <3 days per week        | 109             | 34             | $42.14 \pm 9.78$     |             |           |
|                                         | 3~5 days per week       | 54              | 16.8           | $38.7 \pm 9.94$      |             |           |
|                                         | >5 days per week        | 46              | 14.3           | $34.41 \pm 9.48$     |             |           |
|                                         | Unknown                 | 40              | 12.5           | $45.73 \pm 8.12$     |             |           |
| Diagnosis                               | Lung cancer             | 57              | 17.8           | $40.39 \pm 10.77$    | 3.589       | 0.002     |
|                                         | Lymphoma                | 103             | 32.1           | $43.3 \pm 9.834$     |             |           |
|                                         | Leukemia                | 36              | 11.2           | $37.5 \pm 9.81$      |             |           |
|                                         | Myeloma                 | 21              | 6.5            | $34.62 \pm 9.95$     |             |           |
|                                         | Colorectal cancer       | 32              | 10             | $43.94 \pm 8.14$     |             |           |
|                                         | Gastric cancer          | 20              | 6.2            | $42.85 \pm 9.87$     |             |           |
|                                         | Other                   | 51              | 16.2           | $40.37 \pm 11.55$    |             |           |
| Stage of disease                        | I                       | 2               | 0.6            | $40.5 \pm 16.26$     | 1.823       | 0.124     |
|                                         | II                      | 33              | 10.3           | $39.06 \pm 11.31$    |             |           |
|                                         | III                     | 50              | 15.6           | $41.58 \pm 9.89$     |             |           |
|                                         | IV                      | 200             | 62.3           | $42.01 \pm 10.36$    |             |           |
|                                         | Acute phase             | 36              | 11.2           | $37.5 \pm 9.81$      |             |           |
| Duration of illness                     | 0~5 months              | 115             | 35.8           | $41.97 \pm 9.93$     | 1.332       | 0.265     |
|                                         | 6~12 months             | 87              | 27.1           | $39.62 \pm 11.19$    |             |           |
|                                         | >12 months              | 119             | 37.1           | $41.41 \pm 10.23$    |             |           |

\*RMB, Renminbi.

spiritual care needs score was used as the dependent variable. Multiple linear regression analysis showed that the influencing factors of spiritual care needs of patients with late-stage cancer included age ( $t = -4.24$  and  $P < 0.01$ ), occupation ( $t = -2.971$  and  $P < 0.01$ ), and alcohol consumption ( $t = -3.477$  and  $P < 0.01$ ). The impact of disease diagnosis and exercise factors on the spiritual care needs of patients with advanced cancer was not significant ( $P > 0.05$ ). For other independent variables, the impact of diagnosis was not significant, possibly due to the uneven distribution of the number of individuals diagnosed with different diseases in the sample. The impact of exercise was also not significant, possibly because the definition of exercise was not clear enough to effectively control the influence of other factors. See Tables 3 and 4 for detailed multiple regression results.

## 5. Discussion

In this study, the mean score of spiritual care needs of the 321 patients with cancer who participated was moderately skewed. Cancer is caused by chemical, physical, biological, genetic, and other factors [1, 2]. Most of the affected individuals exhibit strain, anxiety, an increasing desire for survival, and markedly increased spiritual needs due to the distressing feelings caused by the increasing and strong harm that the disease produces in the body during the treatment process, treatment stress, and fear of death [9, 11, 13]. Similar studies have found that a large proportion of patients with cancer have spiritual distress along the course of their illness, especially those in the advanced stages [10, 13]. When patients have obvious cancerous symptoms and are about to enter the predeath stage, there is a general loss of confidence in life, the negative emotions are serious, the fear of death is aggravated, and their spiritual needs are higher [17, 18].

Previous studies showed that factors influencing the need for the spiritual care of patients with advanced cancer include religiosity, length of illness, and fear of death. Patients with advanced cancer who have religious beliefs, a longer illness duration, and fear of death have relatively high spiritual care needs. Individuals with faith in religion can actively seek a sense of inner belonging and support beliefs [19]. This ability to actively seek is spiritual in itself. They acquire a purified mind and psychological comfort through various religious activities and rituals in their daily life and have a very high desire for physical health [20]. Individuals with religion have good health outcomes because of their self-comfort in their daily life compared to those without religion [19–21].

Having good illusions and expectations about anything in life, a stronger inner desire for spiritual care, and becoming ill, will result in a great psychological fall due to the body bearing inescapable suffering and disadvantages of the illness itself [11]. Thus, they have a higher need for spiritual care during illness [10]. In addition, patients with longer disease duration were greatly harmed, physically and psychologically, by the long affliction of the disease, depression and other emotions, and repeated treatment, degree of desire for the world decreased, desire to lose life, the need for spiritual care also

increased [22]. Patients with a stronger desire to live and a great fear of dying have more frequent and greater degree of emotions such as anxiety and depression when chronically afflicted by illness and pain, leading to more serious psychological problems and higher possibility of collapse [23–25]. Therefore, these types of patients also have a greater need for spiritual care [10, 26, 27].

This study's results showed that the following factors affected the spiritual care needs of patients with advanced cancer: age, occupation, and alcohol consumption. Age is a crucial factor that negatively correlated with the spiritual care needs of patients with cancer, meaning that the older the age, the lower the spiritual care needs. A study on patients with breast cancer shows that age is an important factor [28]. The older the patient is, the greater their mental pressure and psychological burden will be, and they may need more spiritual care and support [28–30]. However, our research results showed that the older the patient, the smaller their spiritual needs would be. This may be due to older patients with cancer having richer experiences, clearer self-awareness, and a clearer understanding of how to make psychological adjustments compared to those who were younger and can quickly adapt to sudden physiological and psychological changes, resulting in lower spiritual needs.

In our study, patients with cancer who worked in corporate units and were self-employed had relatively low spiritual care needs. These professions often require long working hours and have a high intensity of work pressure, which may lead to physical and psychological fatigue and tension, increasing the risk of various diseases [20, 22, 31]. Moreover, high-intensity work pressure and long hours of work are harmful to both physical and mental health, increasing the risk of developing diseases such as cancer [3]. However, this high intensity of work pressure may force patients to have no time to consider their health status, resulting in lower natural spiritual needs. In addition, patients with cancer who suffer from discrimination in the workplace may have a significant impact on their quality of life and physical and mental health [31–33].

The profession and drinking habits of patients negatively impacted the spiritual care needs of patients with cancer that is, those who worked in corporate units, operated independently, or had drinking habits had relatively low spiritual care needs. A recent study found that light drinking can increase the risk of esophageal cancer, liver cancer, breast cancer, and other cancers [34]. In addition, long-term alcohol abuse not only increases the risk of cancer but also negatively impacts patients' psychological and social life, reducing their quality of life [35–37]. Moreover, patients with cancer who have drinking habits may do not believe that drinking alcohol is harmful to their health, have low attention to their own health, and are less concerned about spiritual needs. Therefore, patients with drinking habits have lower spiritual needs.

In addition to the aforementioned factors, the association among occupation, drinking habits, and spiritual care needs could potentially be influenced by the interplay of age, gender, economic status, personality traits, and other factors, which might contribute to the systematic differences in

TABLE 3: Multiple linear regression analysis assignment of numerical values to categorical variables.

| Factor     | Value assignments                                                                                                             |
|------------|-------------------------------------------------------------------------------------------------------------------------------|
| Age        | 18~44 = 1, 45~59 = 2, ≥60 = 3                                                                                                 |
| Occupation | Institution = 1, enterprises = 2, self-employed = 3, temporary worker = 4, other = 5                                          |
| Drinking   | Never = 1, <once per month = 2, 1-2 times per month = 3, 1-2 times per week = 4, 3-4 times per week = 5, almost every day = 6 |
| Exercise   | Never = 1, <3 days per week = 2, 3-5 days per week = 3, >5 days per week = 4, unknown = 5                                     |
| Diagnosis  | Lung cancer = 1, lymphoma = 2, leukemia = 3, myeloma = 4, colorectal cancer = 5, gastric cancer = 6, others = 7               |

TABLE 4: Multiple linear regression of influencing factors of spiritual care needs of patients with cancer ( $n = 321$ ).

| Variable   | Coefficient | Standard error | Standardization coefficient | <i>t</i> value | <i>P</i> value |
|------------|-------------|----------------|-----------------------------|----------------|----------------|
| Constant   | 55.928      | 2.603          | —                           | 21.488         | <0.001         |
| Age        | -3.042      | 0.718          | -0.228                      | -4.24          | <0.001         |
| Occupation | -1.168      | 0.393          | -0.158                      | -2.971         | 0.003          |
| Drinking   | -1.461      | 0.42           | -0.185                      | -3.477         | 0.001          |
| Exercise   | -0.279      | 0.425          | -0.035                      | -0.656         | 0.512          |
| Diagnosis  | -0.135      | 0.26           | -0.027                      | -0.517         | 0.605          |

$R^2 = 0.122$ ,  $F = 8.758$ ,  $P < 0.001$ .

occupational distribution and drinking patterns, thereby impacting spiritual care needs [38–40]. Therefore, caution should be exercised when interpreting the relevant findings, avoiding overstating causal relationships. Future research should control for relevant variables to further validate the complex relationships among these factors.

Furthermore, our results also indicated that other independent variables, such as diagnosis and exercise, had no significant impact on the spiritual care needs of patients with cancer. This may be due to the uneven distribution of the number of individuals diagnosed with different diseases in the sample, and the number of individuals with certain diseases may be too small, resulting in significant errors in statistical analysis. Therefore, the impact on diagnosis was not significant. To address this issue, measures such as increasing sample size or controlling for other possible interfering factors can be adopted in the analysis to improve the study's reliability and accuracy. The impact of exercise on the spiritual needs of patients with advanced cancer is not significant because there may be differences in the definition and measurement methods of exercise in different studies, which can also affect the reliability and accuracy of the results. To address this issue, standardized exercise measurement methods can be adopted, by using tools such as the International Physical Activity Time Questionnaire (IPAQ) to measure exercise volume, to ensure the reliability and comparability of the results [41–43].

Medical staff can develop different spiritual care plans for patients with cancer of different age groups, professions, and drinking habits to help improve their quality of life. For example, for older and weaker patients, gentle and soothing care can be used to help alleviate pain and discomfort. For patients with high occupational pressure and physical weakness, relaxation and stress relief can be adopted to help them recover their physical and mental health, and for those who have been drinking or drinking excessively for a long

time, abstinence and rehabilitation care methods can be adopted to help them recover their physical health.

The innovation of this study is manifested in several distinct aspects. First, utilizing the biopsychosocial-spiritual model as the theoretical backbone [8], this research systematically explores the diverse factors influencing the spiritual needs of patients with advanced cancer. The adoption of this model facilitates the construction of a tailored spiritual care model specifically for Henan province, which may have broad implications for other regions in China as well. Second, conducted within the unique sociocultural milieu of China, this study uncovers the distinct spiritual experiences and needs of Chinese patients. It contributes new perspectives to the global discourse on spiritual care, emphasizing the cultural nuances that shape such practices. Third, this research highlights novel empirical findings, including the negative correlation between age and spiritual needs and the impacts of occupation and alcohol consumption on these needs. These insights are crucial for developing targeted spiritual care strategies for patients with advanced cancer, providing both theoretical and practical benefits.

Our study has several limitations that warrant further improvement. First, the representativeness of the sample is limited. The current study sample may not represent all patients with advanced cancer due to regional and cultural homogeneity. Future research should expand the sample size and include more diverse samples, such as patients from different regions of China, various ethnic groups, or even conduct cross-national studies to enhance the external validity and generalizability of the findings [44]. This would not only contribute to the formulation of generalizable and comparable research results but also promote the exchange of experiences and international cooperation in cancer prevention and control across different countries and regions.

Second, the limited sample size affects the reliability and applicability of some subgroup analysis results. Although a sample size of 321 may be sufficient for assessing overall spiritual care needs and conducting certain statistical analyses, when exploring the relationship between variables such as occupation, drinking habits, and spiritual care needs, some subgroups (e.g., specific occupational categories and drinking frequency subgroups) had relatively small sample sizes after stratification, which might affect the reliability and precision of effect size estimates in the relevant subgroup analyses. Future research should expand the sample size and ensure a balance in sample sizes across subgroups to obtain more robust and generalizable conclusions. However, as an exploratory study, the findings still hold theoretical and practical significance.

Third, cultural sensitivity and research design need to be optimized. Future research could adopt the following measures: provide cultural competency training for researchers to enhance their sensitivity; include researchers from diverse cultural backgrounds to optimize research design; use culturally adapted instruments to improve measurement reliability and validity; and conduct stratified analyses for specific cultural subgroups when feasible to provide evidence-based support for culturally tailored spiritual care services. In controlling for confounding factors, future research could match patients' demographic characteristics, include more potential influencing factors, and employ multivariate regression, path analysis and other methods to exclude the influence of confounding factors and elucidate the independent effects of variables.

The samples we studied were from patients with cancer in specific regions, and there may be regional and cultural differences. Therefore, the universality of the results needs further research and verification. We look forward to continuously improving the research design, expanding the sample size, and enhancing the representativeness and precision of our research to provide a more robust evidence base for spiritual care practices for patients with advanced cancer. Future research can further validate this study's results by expanding the sample size, considering different cultural and regional backgrounds. Furthermore, future studies can delve into the impact of spiritual care on patients with cancer in different cultural and regional backgrounds and explore the impact of spiritual care on patients with other chronic diseases, such as heart disease and diabetes, among others to expand research fields and contribute more research results. Simultaneously, our statistical analysis results also provide useful information for healthcare professionals and public health policymakers to develop better prevention and intervention measures, especially for those important factors that affect the health status. Medical staff can focus more on these factors and help patients improve their lifestyle and work environment, thereby improving treatment effectiveness. Public health policymakers can use these results to design more targeted health promotion plans and promote the improvement of public health levels.

## 6. Conclusion

This study accurately analyzed the spiritual care needs of patients with advanced cancer and developed targeted care programs to meet these needs, highlighting the importance of helping patients fulfill end-of-life wishes, alleviating their inner regrets and distress, and enhancing satisfaction. The study also emphasized the critical role of medical social workers and psychiatrists in providing support, fostering harmonious patient-caregiver relationships, respecting patients' religious beliefs, and creating a positive therapeutic environment. This aims to ensure that patients can experience the beauty and inclusiveness of the world in their final stages of life. Regarding future research directions, in addition to cross-sectional studies, longitudinal follow-up studies could be considered. By conducting multiple assessments and follow-ups of patients at different stages of their illness, we can better understand the dynamic changes in spiritual care needs and the causal relationships between influencing factors and spiritual care needs. This will help us gain a deeper understanding of the spiritual care needs of cancer patients and provide crucial insights for developing and refining targeted interventions.

## Data Availability

**Public Data Access:** The data from this study have been anonymized to protect patient privacy and are not available in a public online database. Access is directly managed by the corresponding author to ensure compliance with ethical standards. **Restricted Data:** Due to the sensitivity of patient data collected through hospital questionnaires, public access is restricted in accordance with privacy laws and ethical guidelines. **Requesting Data:** Researchers may request access to the data by contacting the corresponding author, details of which can be found in the author information section. Requests must include a research proposal and are subject to an approval process that includes ethical review and data protection compliance. **Compliance:** Access is granted only under strict conditions that ensure the data are used solely for legitimate research purposes and confidentiality is maintained, adhering to all relevant data protection regulations. **Our Commitment:** We are committed to responsibly sharing data, balancing scientific advancement with the security and privacy of patient information. Our procedures are designed to support valid scientific inquiries while protecting sensitive data, in accordance with the journal's data sharing policy.

## Disclosure

The funding source was not involved in the study design; in the collection, analysis, and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.



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