Analysis of Factors Influencing Quality of Life of Chinese Cancer Patients

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Abstract:

Cancer is a frequent chronic illness with a high mortality rate. With the rapid development of society and population aging yearly, there is an increase in the incidence and death of cancer, seriously threatening human health and survival. In recent years, with the advancement of medical technology, the methods and technologies for treating cancer have also increased year by year. At the same time, people have also become more concerned with the quality of life for cancer sufferers. People have gradually realized that the purpose of medical treatment is not only to focus on prolonging life, it is equally important to pay attention to their quality of life. By examining the status quo of the quality of life of cancer patients and delving into the factors that influence their quality of life, this paper seeks to serve as a reference for clinical nursing intervention. The study will use correlation quantitative research and select 205 cancer patients from the oncology departments of three hospitals in China. The questionnaires included a general patient information questionnaire， European Organization for Research and Treatment of Cancer Quality of Life core scale (EORTC QLQ-C30). Data processing and analysis will be carried out using IBM SPSS 26.0.

Keywords: Cancer, EORTC QLQ-C30, tertiary hospitals, influencing factors

1. INTRODUCTION

Cancer is one of the most serious diseases endangering the well-being and life of humans, and its morbidity and mortality rates have been steadily rising in the previous years (Ferlay et al., 2018). According to the most recent global cancer data released by the World Health Organization's (2022) International Agency for Research on Cancer (IARC), in 2020, Breast cancer will replace lung cancer as the most commonly diagnosed cancer globally. Lung cancer, liver cancer, stomach cancer, breast cancer, and colorectal cancer are the top five causes of cancer-related deaths（Cao et al., 2020）. There will be a total of 19.29 million new cases of cancer worldwide, with China accounting for 4.57 million. accounting for 23.7% of the world. There were 9.96 million cases of which 3 million were cancer deaths in China, accounting for 30% of the total number of cancer deaths. Both new cases and death rates rank first in the world. From this point of view, cancer has become a major disease that seriously endangers the health of Chinese residents and the people must pay attention to it.

In order to improve the survival rate of cancer patients, they usually need to be hospitalized repeatedly to receive surgery, chemotherapy, and radiotherapy. In general, large-dose, combined, and multiple treatments are commonly used. Diseases and repeated treatments not only bring pain and discomfort, but also to a certain extent, cause huge physiological, psychological, and spiritual impacts on patients, and

are prone to anxiety, depression, and other psychological problems. It can even reduce treatment compliance, cause suicidal thoughts, and greatly affect their quality of life. With the transformation of medical model to physiology-psycho-social medical model, people's philosophy of cancer treatment has also changed towards improvement or enhancement of the qualities of life of cancer patients while pursuing clinical cure, reducing tumor size, and prolonging survival time. The comprehensive evaluation of the quality of life of cancer patients reflects the survival, prognosis, and living conditions. This has become one of the important indicators of cancer clinical research. Researchers believe that focusing on the quality of life for cancer patients is crucial because cancer treatment typically involves a complex, comprehensive process, including surgery, radiotherapy, and chemotherapy, which has significant impacts on both the physical and psychological well-being of patients. In comparison to other diseases, cancer patients require longer-term monitoring and treatment, possibly lifelong attention, making understanding and improving their quality of life essential for long-term recovery.

A complex idea from the sociological realm, quality of life has many different aspects. As a sociological concept, it reflects the ability of human beings to carry out activities to improve their living level and chances. Although there have been relatively mature relevant studies, no universally recognized concept has been formed so far (Fager Lind et al., 2010). Currently, The World Health Organization's (WHO) definition is generally acknowledged to be accurate- quality of life refers to the experience of individuals in different cultures and value systems to their goals, expectations, standards, and concerns about their living conditions, including physical, mental, spiritual, and social health which can have a more comprehensive understanding of people's life quality situation (Xie, 2020). Cancer patients have diverse needs due to individual differences, encompassing both physical and psychological aspects. By focusing on patients' daily life experiences, psychological states, and social interactions, an understanding of individual variances among cancer patients can be gained. Healthcare providers can then deliver more personalized and targeted care services. Simultaneously, emphasizing life quality in nursing practice fosters improved communication and trust between patients and healthcare providers, encouraging patients to actively engage in the treatment process. Therefore, attending to the quality of life for cancer patients is not only meaningful in the context of treatment but also has a positive impact on the comprehensiveness, personalization, and psychological support aspects of nursing practice. The cultural environment in China may be different from other regions, and the medical systems of different hospitals may also be different. Therefore, studying the quality of life of cancer patients in a hospital in China will not only help to meet the particularities of the local culture and medical system, but also improve the quality of life for patients. Quality of Life provides more targeted approaches and solutions.Therefore, the purpose of this study is to understand the current quality of life of Chinese cancer patients, identify key factors that significantly affect their quality of life, and further provide scientific basis for healthcare professionals to improve patients' quality of life.

2. STUDY OBJECTIVES

2.1. General Objective

This study aimed to identify factors influencing the quality of life of Chinese cancer patients.

2.2. Specific Objectives

2.2.1. To describe the socio-demographic characteristics of the respondents as to

a. Age

b. Sex

c. Civil Status

d. Highest Educational Attainment

e. Annual Family Income (yuan)

2.2.2. To identify the clinical characteristics of the respondents as to:

a. Type of Cancer

b. Staging

c. Treatment/s

d. Length of Diagnosis

2.2.3. To identify the QOL of the respondent as to:

a. Functional Scales

b. General Health;

c. Symptom scales

2.2.4 To ascertain the relationship between socio-demographic elements and clinical characteristics with the quality of life of cancer patients.

3. REVIEW OF RELATED LITERATURE

3.1. Cancer: Definition and Epidemiology

In recent times, the noticeable trend of rapid population growth is becoming increasingly evident and the causative factors are becoming increasingly intricate. Cancer is predicted to be the major cause of death in the world in the 21st century due to the fact that its incidence and mortality are rising globally every year and are obviously younger, hindering the natural growth of human lifespan to a large extent. Malignant tumor is another term used to describe cancer. In medicine, cancer is the term used to describe the malignant tumor that develops from epithelial tissue, which is the most typical type of malignant tumor unlike a benign tumor. Cancer arises from the cells of the body, indicating a specific medical condition. Cancer cells can frequently infiltrate the organs around them and even spread to other parts of the human body via the lymphatic or circulatory systems.

3.2. Quality of life of cancer patients

The quality of life for cancer patients varies significantly across nations, influenced by the varying levels of development. The goal of cancer detection and treatment has evolved in nations with highly developed healthcare systems to improve the quality of life for cancer patients. In less-developed regions such as Africa, where most cancer patients still face problems such as poverty and inadequate medical resources, quality of life is still a vague concept. In recent years, researchers have usually summarized and summarized based on existing knowledge. However, with the changes in society, few researchers have focused on new factors to conduct correlation investigations, or used more sophisticated research designs to conduct in-depth research. Specific areas are explored to provide a more comprehensive understanding of factors influencing quality of life in cancer patients.

Although previous research has mainly focused on the psychological aspects of end-of-life care for cancer patients, such as improving the quality of life and mental health through end-of-life care for elderly cancer patients. Some domestic studies tend to analyze the issue from the perspective of the primary caregivers of cancer patients, they believe that the overall quality of life for primary caregivers of cancer patients is generally low, and it is related to the caregivers' own factors as well as the emotions and conditions of

cancer patients (Meng et al., 2022).

Most studies have concentrated on the quality of life for cancer patients and the primary caregivers themselves at different age stages (Bi, 2019). For instance, adolescent cancer patients often exhibit rebelliousness, emotional instability, and dependency due to being in the adolescent stage, resulting in lower quality of life for both the patients themselves and their primary caregivers(Gao & Zhu, 2022). Elderly cancer patients and their primary caregivers, while facing the challenges of the disease and undergoing treatment, experience psychological consistency. As the mental health of primary caregivers improves, the level of psychological consistency increases, caregiving abilities improve, and similarly, the psychological health of cancer patients also improves(Tian, 2023).

However, we not only focus on the psychological health of patients but also shift the attention to the overall correlation between personal factors such as age, gender, family, and clinical disease-related factors and the quality of life scores. This shift not only addresses this gap but also enhances the understanding of specific factors influencing the quality of life for cancer patients. More importantly, it contributes to a comprehensive understanding of the quality of life for cancer patients. We will explore the specific sociodemographic and clinical factors related to the quality of life for cancer patients, providing valuable insights for future research and clinical practice.

3.3. Socio-demographic factors and quality of life in cancer patients

Patients' general conditions, such as age, marital status, education level, economic level, may affect patients' cognitive ability, understanding ability, and self-regulation ability, consequently, these factors can have diverse effects on the quality of life experienced by individuals. Li et al. (2018) conducted longitudinal follow-up through 174 patients with cervical cancer during chemotherapy. It was found that economic status, education level, and fertility status were factors influencing patients' quality of life during chemotherapy. There is a positive correlation between a higher quality of life for patients and improved fertility rates, economic status, and education levels. Huang et al. (2022) investigated the risk factors associated with poor quality of life in patients with head and neck cancer and found that most of the patients with poor quality of life were male patients with tracheostomy, smoking, single or divorced marital status, and alcohol abuse.

3.4. Clinical factors and quality of life in cancer patients
3.4.1. Physiological and Psychological Factors

The majority of studies have demonstrated that cancer patients' psychological suffering is typically evident and that there is a strong negative relationship between psychological suffering and quality of life, and psychological status is an important factor affecting the quality of life of patients as well. Gu et al. (2023) found through a study of 566 patients in the Affiliated Hospital of China Medical University that anxiety and high blood pressure were negatively correlated with the quality of life of patients with gynecological cancer, and the interaction between anxiety and high blood pressure had a negative effect on patients with gynecological cancer. The quality of life was greater than the influence of a single factor. Mun Sohee et al. studied the effect of patients' self-care ability on the quality of life of patients with gynecological cancer chemotherapy and showed that patients can effectively improve the quality of life of patients by participating in projects that may improve physical function and rehabilitation process and promote activities of daily living (Mun & Park, 2022).

3.4.2. Social Support

Social support is a multi-dimensional concept, involving many factors. Cancer needs not only the treatment of drugs but also the support of the family and society of cancer patients, especially the encouragement of spouses and children. Studies by Shi et al. (2015) have shown that reliable family support can improve the quality of life and family members often get together to discuss how to face the disease, which can increase family cohesion and ultimately improve the quality of life of patients. Gonzalez-Saenz de Tejada et al. (2017) have also shown in their study that the higher the social support, the better the management of anxiety.

Social support serves as a protective buffer, mitigating the adverse effects of psychological stress on the individual's overall health. Therefore, social support is likely to play an intermediary role in anxiety symptoms affecting quality of life (Ren et al.,2020). Previous studies have shown that (Zhong, 2020), social support can be used as an intermediary variable to affect the quality of life. Good social support makes patients face the disease in a more positive way, and then improve their quality of life and prolong their survival. Studies by Ren Lipping and others also show that the quality of life of cancer patients can be more effectively improved by effectively evaluating cancer stages, reducing the level of depression of cancer patients, improving the level of social support of patients, and regulating CIPN symptoms. When Wang et al. (2022) studied the symptom groups of patients with esophageal cancer and their effects on the quality of life, they also showed that increasing social support can improve the quality of life of patients with esophageal cancer.

3.4.3. Solution

Coping style pertains to the cognitive and behavioral approaches adopted by individuals when confronted by challenges and stressful circumstances. Whether you have cancer, the degree of malignancy of the lesion, whether the lesion has metastasized, and worry about the effect of treatment are all strong negative life events faced by cancer patients. In the face of these negative life events, different cancer patients adopt different coping strategies Active coping can reduce the stress response of patients, which is beneficial to physical and mental health, while negative coping can aggravate stress, which is not conducive to physical and mental health. On the contrary, negative coping styles can increase the psychological stress caused by stress, the more negative coping style, the worse their physical cognition and social function (Shi & Xu, 2018). In a study of 117 elderly lung cancer patients who were hospitalized, Shao et al. (2016) discovered that the majority of these patients had negative coping mechanisms, which were significantly correlated with quality of life. Overall quality of life, role function, emotional function, and social function of patients with lung cancer were negatively correlated with yield coping. Through the study on the self-efficacy, coping style, and quality of life of informal caregivers of 222 patients with head and neck cancer, Vans et al. (2023) found that improving self-efficacy and "active coping" can help to reduce psychological distress and improve quality of life.

3.5. Conceptual framework

The conceptual framework of this study provides an in-depth exploration of factors influencing the quality of life of Chinese cancer patients, covering multiple key dimensions. These dimensions include patient age, gender, socioeconomic status, treatment modalities, disease stage, and specific cancer type. Through systematic analysis, we aim to reveal the intricate interrelationships between these factors to more fully understand the formation mechanism of patients' quality of life. This framework not only helps identify differences within patient groups, but also provides a deep theoretical foundation for the design of

personalized rehabilitation and support strategies, thereby providing targeted guidance for improving the overall life experience of cancer patients.
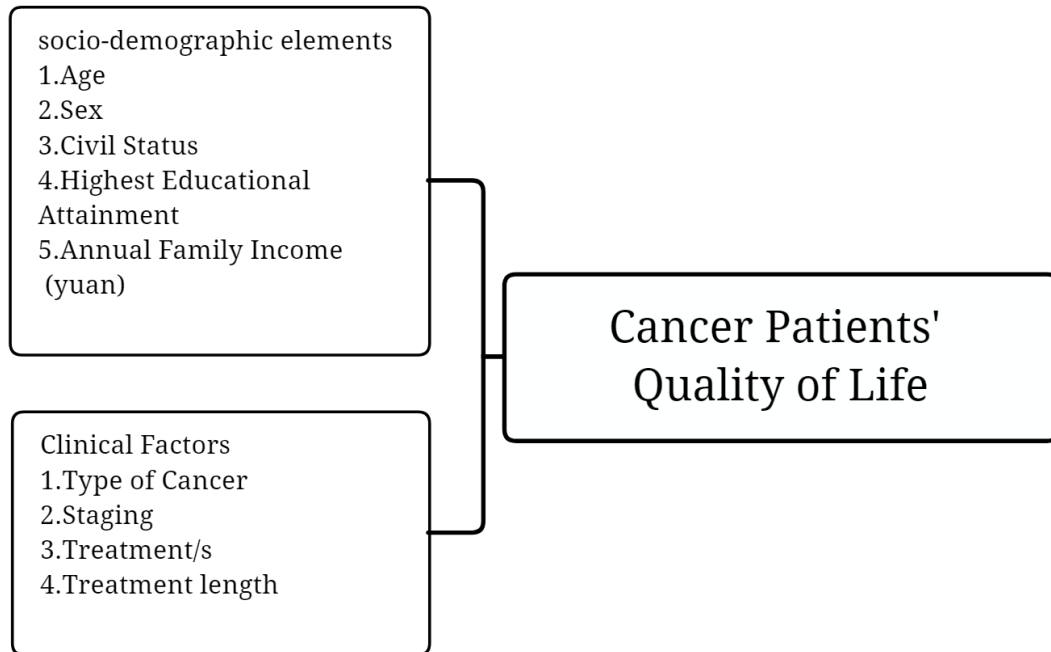
3.6. Future Research Perspectives

At present, in the care of cancer patients, medical staff pay more attention to the improvement of patients' clinical symptoms and prolongation of survival, but ignore the decline of patients' quality of life. During the long course of treatment, patients will not only experience the pain caused by the disease itself, long-term chemotherapy, and complications, as well as the decline of physiological and social functions, but also psychologically produce negative emotions such as anxiety, pessimism, and impatience, which will lead to a decrease in the quality of life of patients. Research on the quality of life of cancer patients and its influencing factors can effectively improve the psychological status of patients and improve the quality of life of patients, which is of great significance to the treatment and prognosis of the disease. At the same time, it is conducive to reducing social burden and promoting harmonious development of society.

4 METHODS

Research methods are specific procedures for collecting and analyzing data. Developing research methods is an integral part of research design.

4.1. Study Design and Locale

The study used a quantitative descriptive correlation design. A correlational research design investigated relationships between two variables (or more) without the researcher controlling or manipulating any of them. It was a non-experimental type of quantitative research. In this study, the researchers analyzed the factors affecting the quality of life of cancer patients by describing the basic demographic profile, clinical characteristics, and quality of life of cancer patients in the investigated hospitals.

This study was conducted in the three largest hospitals with the largest number of patients in Guangrao

County, Dongying City, Shandong Province, China.

4.2. Study Participants

4.2.1. Sample Size and Sampling

Target participants in this study were cancer patients from selected hospital in Shandong Province, P.R. China. The selection of participants was done using purposive sampling considering any cancer case from among 18 to 59 years old patients. Considering these characteristics, 205 patients qualified to participate and the study proceeded involving these group of participants.

4.2.2. Inclusion and Exclusion Criteria

The respondents of the study included diagnosed cancer patients within one month aged 18 to 59 years old, regardless of cancer treatment modalities, and those who agreed to join in the research study.

Exclusion criteria included those who were unable to complete the form due to physical reasons, and those who were mentally and socially incapable of answering the study instruments.

4.3. Research Instruments

The questionnaires consisted of a general information questionnaire, the EORTC Quality of Life Measurement Scale (EORTC QLQ-C30). EORTC QLQ-C30 is a system developed by the European Organization for Research and Treatment of Cancer Patients (EORTC) to determine the quality-of-life system core scale. The current quality of life assessment scale for cancer patients was the third edition of EORTC QLQ-C30, which had been translated into 54 languages and was the most frequently used quality of life assessment scale in Europe. A Chinese scholar once measured 289 cancer patients in a randomized controlled trial and the results showed that EORTC QLQ-C30 was feasible, effective, and practical in cancer patients in mainland China (Wang et al., 2000). EORTC QLQ-C30 was specially developed for cancer patients. The questionnaire design was comprehensive and could reflect the quality of life from many angles. Likewise, the questionnaires were simple and easy to implement and had strong applicability. Therefore, the EORTC QLQ-C30 was selected as the measurement tool of quality of life in this survey.

4.3.1. General Information

This study involved collecting basic information from patients to gain a deeper understanding of factors influencing their quality of life. The questionnaire included factors such as age, Sex, Civil status, Highest Educational Attainment, Annual family income, as well as the patient's Type of Cancer, Length of Diagnosis and the duration of participation in treatment. Gathering this information helped comprehensively grasp the overall life situation of participants, laying the groundwork for a more in-depth exploration of specific aspects of life quality.

4.3.2. Quality of life assessment

The quality-of-life scale (EORTC QLQ-C30) for cancer patients developed by the Therapeutic Organization of the European Agency for Research on Cancer (Aaronson, 1993) was used to evaluate the quality of life. The 30 entries of EORTC QLQ-C30 could be divided into 15 domains consisting of 5 functional domains (physical, role, cognitive, emotional, and social functions), 3 symptom domains (fatigue, pain, nausea, and vomiting), 1 general health/quality of life domain, and 6 single entries (each as one domain). For symptom areas, higher scores indicated more symptoms or problems (and poorer quality of life). For functional areas and general health areas, higher scores indicated better functional status and quality of life.

4.4. Specific Procedures Based on Study Objectives

4.4.1. Procedure 1 Face-to-Face Communication Letters

In addition to distributing questionnaires in person to each manuscript, the researcher personally wrote letters to inform all study participants about the project and specifically requested their voluntary manuscript.

4.4.2. Procedure 2 Face-to-Face Distribution of Questionnaires

The research questionnaires consisting of the EORTC QLQ-C30 questionnaire, general questionnaire, and VAS scale were provided in paper format. The researcher hand-delivered these questionnaires to manuscript, providing instructions on how to complete them. Completing the questionnaire was estimated to take approximately 20 minutes.

4.4.3. Procedure 3: Follow-up Face-to-Face

The researcher conducted face-to-face follow-up visits with individuals who had not responded to the survey within two weeks of the initial distribution, encouraging and reminding them to manuscript in the study.

4.5. Ethical Considerations

Researchers obtained Angeles University Foundation Research Ethics Board and Chinese Review Board approval before conducting data collection.

4.5.1. Informed Consent Process, Duration of Participation, and Withdrawal Criteria

All participants were provided with a written agreement for their consent. In our study, the informed consent process was critical and was designed to ensure that participants fully understood the purpose, procedures, risks, and possible benefits of the study. Informed consent served as a critical step to protect the rights of participants and ensure the legitimacy of the research. Participants were provided with detailed information including the purpose of the study, anticipated procedures, possible risks, and benefits. The information was presented in a concise and understandable manner to ensure that participants could clearly understand and make a voluntary decision about participating in the study. Our informed consent forms included participant rights, the specific purposes and intended procedures of the study, and a detailed description of the risks and benefits that may be involved. Participants signed an informed consent form after answering any questions or concerns that may arise in detail. We accurately recorded the signing date, participant and researcher signatures to ensure the transparency and legality of the entire process.

Moreover, this study abided by the ethical standards set for medical research. The purpose of the project was clearly communicated to every participant involved and they willingly granted permission for data to be used for research purposes. Participants retained the right to discontinue their participation in the survey at any given time and participants could not be compelled to complete the survey responses. Information provided by patients was used only for this study and was not disclosed or used for other purposes.

4.5.2. Vulnerability Statement

In our study, we paid special attention to and protected participants who may have faced vulnerabilities and we pointed out specific factors that may have affected participants' ability to understand or make decisions autonomously such as age, education, and cultural background. We assessed the additional risks that vulnerable participants may have faced in research and took steps to ensure that they received special

attention and protection. To help vulnerable participants understand and participate in the informed consent process, we used simplified language, diagrams, and additional explanations and support. Our research ethics committee reviewed and approved safeguards for handling vulnerable participants to ensure the research complied with ethical standards and legal requirements. Through these measures, we ensured the ethical compliance of the research while protecting the rights and safety of all participants.

4.5.3. Risks and Inconveniences

The study contained negligible risk and only the time and inconvenience for data gathering were identified which may have been mitigated by emphasizing the importance of the study in the improvement of their care as cancer patients.

This study strictly followed the research ethics standards approved by the National Ethics Committee to ensure that the privacy and rights of participants were fully protected. In some cases, the research team immediately adopted a listening and understanding attitude, provided emotional support, and provided suggestions based on the situation when participants experienced emotional stress. Whether participants remained in the study or sought professional mental health support. All treatments were performed after approval by the Research Ethics Review Board and all situations related to emotional stress were recorded and reported in detail to ensure the legality and ethics of the research.

4.5.4. Benefits of the Study

This study offered a certain clinical foundation for investigating the variables influencing cancer patients' quality of life, minimizing their physical and emotional suffering, and enhancing patients' quality of life. At the same time, the researcher would like to thank all patients who voluntarily participated in the survey.

4.5.5. Privacy, Confidentiality, and Data Management

This study strictly followed the research ethics standards approved by the National Ethics Committee to ensure that the privacy and rights of participants were fully protected. If, under special circumstances, participants experienced emotional stress due to the involvement of sensitive topics or personal experiences, when participants experienced emotional stress, as researchers, we immediately adopted a listening and understanding attitude, provided emotional support, and responded appropriately to the situation. Participants were advised whether to continue participating in the study or seek professional mental health support. All treatments were performed after approval by the Research Ethics Review Board, and all situations related to emotional stress were recorded and reported in detail to ensure the legality and ethics of the research.

In this study, in order to protect the privacy and data security of participants, we took the following measures:

All data was anonymized at the time of collection, personally identifiable information (such as name, address, etc.) was removed, and the data was only identified with a unique code to ensure that no individual could be directly identified.

Research data was used only for analysis and reporting for this project, and all releases were aggregate data and did not contain personally identifiable information. Any data sharing was strictly anonymized and subject to a confidentiality agreement with the recipient.

Upon completion of the study, all personally identifiable information was securely destroyed. Aggregated and anonymized data could be retained long-term for future academic research, but the data did not identify any individual.

Through these measures, we ensured that participant privacy was fully protected and data management strictly followed ethical and legal requirements.

4.5.6. Conflict of Interest

The authors declared no potential conflict of interest.

5. STATISTICAL ANALYSIS OF DATA

Statistical analysis of the data will be processed and analyzed using SPSS 26.0. The sociodemographic profile and clinical characteristics of cancer patients will be described using percentages and frequencies. Multiple linear regression analysis will be used to analyze the influencing factors of cancer life quality. The results are statistically significant when $P < 0.05$.

6. RESULTS

6.1 Chinese cancer patients' socio-demographic characteristics

A total of 205 patients participated in the study. The distribution of participants according to their socio-demographic characteristics is shown in table 1. Among these, more than half (110 patients or 53.7%) were 46 to 60 years old, while 54 (26.3%) were 31 to 45 years old, and 41 (20.0%) were 18 to 30 years old. A little more than half (106 or 51.7%) were females, while the rest (99 or 48.3%) were males. In terms of civil status, 93 (45.4%) were married, 72 (35.1%) were widowed, 19 (9.3%) were divorced, 13 (6.3%) were single, and 8 (3.9%) were in cohabitation. Most of the respondents have never been to school (71 or 34.6%), followed by those who were in primary level of attainment (69 or 33.7%), and those who attained secondary level (38 or 18.5%). There were 13 (6.3%) who finished a Bachelor's degree, and 7 (3.4%) who finished Master's and Doctoral degree. Looking at the income, four in every ten patients have more than 100,000 yuan in their annual family income (87 or 42.4%), while all others were those with less than 60,000 yuan annual income (61 or 29.8%), or with income between 60,000 and 100,000 yuan (57 or 27.8%).

Table 1 Chinese cancer patients' socio-demographic characteristics (n=205）

Variable	Classification	Frequency	Percentage (%)
Age (in years)	18~30	41	20.0
	31~45	54	26.3
	46~60	110	53.7
Sex	Female	106	51.7
	Male	99	48.3
Civil status	Single	13	6.3
	Married	93	45.4
	Divorce	19	9.3
	Widowed	72	35.1
	Cohabitation	8	3.9
Highest Educational Attainment	Never been to school	71	34.6
	Primary Level	69	33.7
	Secondary Level	38	18.5
	Bachelor's degree	13	6.3
	Master's Degree	7	3.4
	Doctoral Degree	7	3.4

Annual family income (in yuan)	<60,000	61	29.8
	60,000~100,000	57	27.8
	>100,000	87	42.4

6.1 Chinese cancer patients' clinical characteristics

On Table 2 are the clinical characteristics of the patients in the study. Among the various cases, counts for those with breast cancer exceeded the rest of the cases by not less than 6 percent. (60 patients or 29.3%). For the rest of the cases, at least one in every five patients have Gastric cancers (48 or 23.4%), and lesser count for those with colorectal cancer (35 or 17.1%), lung cancer (31 or 15.1%), or liver cancer (7 or 3.4%). There were seven (3.4%) who currently have other forms of cancer. Moreover, most of the participants are in the early stages of cancer (79 or 38.5%), while others were in the late stage (67 or 32.7%), and in the mid-term stage (59 or 28.8%). More than half of the patients' current treatment is operation (104 or 50.7%), while others undergo chemotherapy (45 or 22.0%), and radiation therapy (43 or 21.0%). Some patients (13 or 6.3%) are undergoing other treatments. Majority have been diagnosed for 2 to 3 years (65 or 31.7%) and over 3 years (60 or 29.3%). Other patients have been diagnosed for 1 to 2 years (34 or 16.6%) or less than a year (46 or 22.4%).

Table 2 Chinese cancer patients' clinical characteristics (n=205）

Variable	Classification	Frequency	Percentage (%)
What type of cancer do you currently have?	Lung cancer	31	15.1
	Gastric cancer	48	23.4
	Breast cancer	60	29.3
	Colorectal cancer	35	17.1
	Liver cancer	24	11.7
	other	7	3.4
What is your current cancer stage?	Early Stages	79	38.5
	Mid-term	59	28.8
	Late Stage	67	32.7
Your current treatment	Operation	104	50.7
	Radiation Therapy	43	21.0
	Chemotherapy	45	22.0
	other	13	6.3
How long have you been diagnosed with cancer?	Within 1 year	46	22.4
	1 to 2 years	34	16.6
	2 to 3 years	65	31.7
	over 3 years	60	29.3

6.3 Dimensions and total scores of Quality of Life of Chinese cancer patients

The quality of life of cancer patients were assessed in terms of functional scales, general or global health status, symptoms scales, and overall QOL score. The mean scores for each dimension and the overall QOL are presented in Table 3. Under the functional scales, higher score means high or healthy level of functioning. In this scale, the patients have a highest mean score in role function (Mn=62.53, SD=22.82),

followed by the physical function (Mn=59.16, SD=20.76), social function (Mn=57.73, SD=23.31), emotional function (Mn=55.33, SD=18.06), and lastly, cognitive function (Mn=48.36, SD=19.95).

Under the symptom scales, higher score represents higher level of symptomatology or problems. The symptom with the highest mean is dyspnea or difficulty breathing with mean 69.11 (SD=30.78). This was followed by diarrhea (Mn= 63.90, SD=32.65), fatigue (Mn=54.86, SD=17.69), pain (Mn=52.85, SD=22.36), and nausea and vomiting (Mn=51.15, SD=20.98). The following symptoms have lower mean scores compared with the others: insomnia with mean 39.18 (SD=28.94), loss of appetite with mean 36.74 (SD=29.42), and constipation with mean 29.10 (SD=28.84). In terms of financial difficulties, the patients have a mean core of 39.01 (SD=26.52).

In terms of general or global health status, higher score means higher QOL. The mean score of the patients is 40.49 with a standard deviation of 23.19. This is less than fifty percent or half of 100; 100 is the highest possible score in the scale.

Table 3 Dimensions and total scores of qualities of life of Chinese cancer patients Scoring (point,±s)

Dimensions	Number of entries	Mean Score
Functional Scales		
Physical function	5	59.16±20.76
Role Function	2	62.53±22.82
Emotional function	4	55.33±18.06
Cognitive function	2	48.36±19.95
Social Function	2	57.73±23.31
Symptom Scales		
Fatigue	3	54.86±17.69
Nausea and vomiting	2	51.15±20.98
Pain	2	52.85±22.36
Dyspnea (Difficulty breathing)	1	69.11±30.78
Insomnia	1	39.18±28.94
Loss of appetite	1	36.74±29.42
Constipation	1	29.10±28.84
Diarrhea	1	63.90±32.65
Economic/Financial difficulties	1	39.01±26.52
General Health	2	40.49±23.19

6.4 Relationship of socio-demographic elements and clinical characteristics with Quality of life of cancer patients in China

This study set the total quality of life score of Chinese cancer patients as the dependent variable. The independent variables considered were the socio-demographic and clinical characteristics of the patients. The final multiple linear regression is shown in Table 4 showing the significant variables associated with Overall Quality of Life.

Annual family income is the socio-demographic characteristics associated with QOL, while current cancer treatment is the clinical factors associated with the general quality of life. Those who have more than 100,000 yuan in family income have 8.80 less general health score compared to those with less than 60,000 yuan income (p-value=0.006).   Furthermore, those undergoing other types of treatment for cancer have 14.14 less quality-of-life scores compared to those who have undergone operation (p-value=0.030).

Table 4 Final regression analysis for Global Health Status/QoL

Variable	Coefficient	p-value	95% Confidence Interval	
Annual Family Income				
<60,000	(base)			
>100,000	-8.80	0.006	-15.11	-2.50
Current Treatment				
Operation	(base)			
Other	-14.14	0.030	-26.93	-1.36

7. DISCUSSION

7.1 The impact of demographic factors on the quality of life of cancer patients

This study found that household annual income significantly affects the quality of life of cancer patients. Patients with an annual income exceeding 100,000 yuan had lower quality of life scores, while those with an annual income below 60,000 yuan had higher scores. This finding is consistent with some existing research results. Xiong et al. (2018) showed that patients with better financial conditions often have higher expectations for treatment outcomes and quality of life, and when these expectations are not met, they are more likely to experience disappointment, leading to a decline in quality of life. This suggests that higher-income groups may experience greater psychological pressure due to the gap between expectations and reality.

Moreover, higher-income patients often face greater work and social responsibility pressures. These patients may need to balance work during their illness and are unable to fully focus on their recovery, which negatively impacts their quality of life. Zhang et al. (2023) pointed out that high-income patients may experience heightened emotional tension and increased psychological burden during treatment because they are unable to set aside their professional responsibilities, thereby affecting their quality of life.

On the other hand, although low-income groups face poorer financial conditions, they often have lower expectations for quality of life. Additionally, these patients may rely more on public healthcare resources and social support systems. Chen et al. (2017) pointed out that social support plays a crucial role in alleviating the psychological stress of cancer patients and improving their quality of life, especially for low-income groups. Therefore, strengthening the social support systems for low-income patients, particularly by providing more emotional support and practical assistance during the treatment process, can effectively enhance the quality of life for this group.

7.2 The impact of clinical factors on the quality of life of cancer patients

This study found that patients who underwent surgery had higher quality of life scores, while those receiving other treatment modalities, such as chemotherapy and radiation, had relatively lower scores. Although surgery is more invasive, it can provide patients with a more direct therapeutic intervention, so

that they have the hope of recovery, while chemotherapy and radiation are often long-term. Miao (2015) demonstrated that surgery, as a direct intervention, can lead to more rapid improvement in patients. thereby enhancing their confidence in rehabilitation and optimism for the future. This positive emotional effect further contributes to an improvement in quality of life.

In contrast, chemotherapy and radiation therapy are effective in prolonging patient survival as long-term treatment methods, which may bring more physical burden to patients. their side effects often have a significant impact on both physiological and psychological health. Common side effects of chemotherapy and radiation therapy include fatigue, nausea, vomiting, and pain, which severely impair patients' physical functioning and lead to a decline in quality of life. A study by Manxia et al. (2024) also demonstrates that the side effects of chemotherapy greatly affect the quality of life of cancer patients, causing not only physical discomfort but also psychological stress, with constant concerns about the possibility of recurrence.

7.3. Implications of clinical practice

Based on the findings of this study, medical teams should prioritize considering the significant impact of family income and treatment methods on cancer patients' quality of life when formulating treatment plans. For high-income patients, the medical team should pay particular attention to managing their psychological expectations, providing counseling to alleviate disappointment due to unmet high expectations. Additionally, assistance should be provided to help patients manage the conflict between work and treatment, reducing the additional psychological burden caused by work stress.

For patients undergoing chemotherapy and radiation therapy, the clinical team should enhance symptom management and control of side effects. For instance, providing medication to alleviate nausea and vomiting caused by chemotherapy, and offering physical therapy and nutritional support to help patients recover strength. Furthermore, the establishment of social support systems is crucial. The presence of family members, emotional support, and professional psychological counseling can all effectively improve the quality of life for cancer patients.

8. CONCLUSION

This study conducted an in-depth analysis of the factors affecting the quality of life of cancer patients and found that household income and treatment methods played significant roles in the variation of quality of life. Specifically, higher annual household income significantly improved the patients' quality of life, while different treatment approaches, such as surgery and chemotherapy, had distinct impacts on quality of life.

However, the study did not find significant effects of other demographic factors （such as age, gender, and lifestyle) on quality of life, suggesting that economic status and treatment choices are critical determinants in maintaining the quality of life for cancer patients. Thus, future clinical practices should focus more on providing economic support and optimizing treatment plans to enhance the overall quality of life for cancer patients.

The limitations of this study include the lack of comprehensive assessment of patients' psychological well-being. Future research should consider incorporating psychological factors to further explore their potential impact on the quality of life of cancer patients.

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