

Analysis of the Status Quo and Influencing Factors of Advanced Lung Cancer Patients' Quality of Life

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Abstract: *Objective:* To investigate the quality of life and related influencing factors of patients with advanced lung cancer. *Methods:* A cross-sectional survey was conducted on 51 patients with advanced lung cancer who were hospitalized in the Department of Oncology from January 2023 to December 2023, and the influencing factors of patients' quality of life were analyzed. *Results:* Among the five functional scales (physical, role, cognitive, emotional, and social functioning) of the QLQ-C30 scale, the social and emotional function scores were the lowest, respectively 16.7 (IQR: 0, 33.3) points, and 16.7 (IQR: 8.3, 25), and among the three symptom scales (fatigue, pain, nausea and vomiting), the fatigue symptom score was the highest: 77.7 (IQR: 66.7, 88.9) points. The results of Spearman correlation analysis showed that the anxiety score of patients with advanced lung cancer was positively correlated with depression score ($P < 0.01$), while the quality of life of patients with advanced lung cancer was not correlated with anxiety and depression score ($P > 0.1$). The self-care ability, the nature of the disease, and whether the patient was treated for chemotherapy were the independent influencing factors of the patient's quality of life, and the difference was statistically significant ($P < 0.001$). *Conclusion:* Patients with advanced lung cancer have different degrees of anxiety and depression, and their quality of life is affected by many factors, which are mainly related to the patient's self-care ability, the nature of the disease, and whether they received chemotherapy.

Keywords: Advanced lung cancer; Quality of life; Anxiety; Depression

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1. Introduction

The incidence of lung cancer in China has been increasing year by year from 2005 to 2013^[1]. Lung cancer has become a malignancy with the highest incidence and the heaviest burden in China^[2]. Most lung cancer patients are in the advanced stage when diagnosed, which progresses rapidly and exhibits a poor prognosis. The main clinical principle is to alleviate patients' symptoms and improve their quality of life^[3]. Studies have shown that anxiety and depression are the most common psychiatric symptoms among patients with advanced lung cancer^[4]. In addition to suffering from physical impairment and pain, patients bear heavy economic and psychological burdens, leading to varying degrees of psychological distress. This significantly reduces their quality of life and

affects the progression of the disease. Therefore, it is crucial to understand the psychological status and quality of life of patients with advanced lung cancer, explore intervention measures, and improve their current situation. In view of this, this study adopts the Chinese version of the core scale (EORTC QLQ-C30 version 3.0) from the quality-of-life assessment system for cancer patients developed by the European Organization for Research and Treatment of Cancer, as well as anxiety and depression scales, to evaluate the quality of life and psychological status of patients with advanced lung cancer. The study also explores the factors that affect the quality of life of patients with advanced lung cancer, providing a reference for nursing intervention measures to enhance cancer patients' quality of life.

2. General information and methods

2.1. General information

Patients with advanced lung cancer who were hospitalized in the oncology department of Yuechi County People's Hospital from January 2023 to December 2023 were selected as the study subjects. Inclusion criteria: (1) predicted survival period < 6 months; (2) histologically confirmed as stage III or IV lung cancer patients^[5]; (3) conscious and able to answer questions; (4) aware of their own condition and diagnosis; (5) voluntary participation in this study and signed informed consent. Exclusion criteria: (1) patients with mental illness or cognitive impairment; (2) patients who transferred to another hospital or gave up treatment.

2.2. Methods

2.2.1. General information survey

A self-made questionnaire was used for the survey, which included items such as gender, age, occupational status, education level, religious belief, marital status, family residence, disease stage, self-care ability, disease nature, and whether chemotherapy was received. All surveyors were uniformly trained. Before the survey, the purpose and significance of the survey were explained to the patients or their families, and after obtaining their consent, the survey was conducted face-to-face. The questionnaire was completed and collected on-site by the patients themselves or the surveyors. A total of 55 questionnaires were distributed, and 51 valid questionnaires were collected, with a recovery efficiency of 92.7%.

2.2.2. Quality of life scale (QLQ-C30)

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) was used^[6]. This scale is the most widely used internationally to evaluate the quality of life of cancer patients, and the Chinese version has good reliability and validity. The scale consists of 30 items, including five functional scales (physical functioning, role functioning, cognitive functioning, emotional functioning, and social functioning) and one overall quality of life subscale (higher scores indicate better functional status and quality of life), as well as three symptom scales and six single symptom assessment items (higher scores indicate more severe symptoms, i.e., poorer quality of life). The scoring method converts raw scores into standard scores ranging from 0 to 100 using a formula.

2.2.3. Self-rating anxiety scale (SAS)

This scale was developed by Zung WK in 1971^[7]. It uses a 4-point Likert scale and consists of 20 items.

The raw score is obtained by summing up the scores of all 20 items. The standard score is then calculated by multiplying the raw score by 1.25 and rounding off to the nearest integer. Scores below 50 indicate anxiety, 50–59 indicate mild anxiety, 60–69 indicate moderate anxiety, and scores above 70 indicate severe anxiety. This scale is suitable for adults with anxiety symptoms and has good reliability and validity.

2.2.4. Self-rating depression scale (SDS)

This scale was developed by Zung WK in 1965^[8], it uses a 4-point Likert scale and consists of 20 items, with 10 items requiring reverse scoring. The total score is obtained by summing up the scores of all items and multiplying by 1.25, rounding off to the nearest integer. Scores below 53 indicate no depression, 53–62 indicate mild depression, 63–71 indicate moderate depression, and scores above 72 indicate severe depression. The SDS has been widely used in China and has good reliability and validity.

2.3. Quality control

Researchers underwent professional training before conducting surveys with patients. Before distributing the questionnaires, patients were informed about the purpose, significance, and filling instructions. Questionnaires were filled out by patients themselves and collected on the spot. Any missing information was completed by the patients immediately. The questionnaire recovery rate was 92.7%.

2.4. Statistical methods

Statistical description and data analysis were performed using SPSS22.0 software. Counting data were expressed as rates and measurement data were expressed as medians (interquartile ranges), i.e., P50 (P25, P75). Patient characteristics, disease features, and treatment modalities were used as grouping variables to compare quality of life scores across different domains and items of the scales. Correlation analysis was performed using Spearman's correlation coefficient. Factors that were statistically significant in univariate analysis or identified in previous studies as potentially affecting the quality of life were included as independent variables and scale scores were included as dependent variables in multiple regression analysis to further explore factors affecting quality of life. $P < 0.05$ was considered statistically significant.

3. Results

3.1. General information of patients

Among the 51 patients, 37 were male and 14 were female. Two patients were aged 18–47 years, 15 were aged 48–60 years, and 34 were aged 60–70 years. Twenty-four patients had primary education or below, 21 had junior high school education, and six had technical secondary school or high school education and above. Forty-seven patients were married, two were divorced, and two were widowed. Twenty-eight patients lived in cities, 22 in rural areas, and one in a township. Twenty-four patients were in stage III and 27 were in stage IV lung cancer. Seven patients had mild dependency, 20 had moderate dependency, and 24 had severe dependency in self-care ability. Ten patients had primary disease onset, and 41 had recurrent disease. Fourteen patients underwent chemotherapy treatment, while 37 did not. All 51 patients experienced varying degrees of anxiety and depression, with 10 cases of moderate depression (19.6%), 41 cases of severe depression (80.4%), 21 cases of moderate anxiety (41.2%), and 30 cases of severe anxiety (58.8%).

3.2. Quality of life scores

Among the five functional scales (physical, role, cognitive, emotional, and social functioning) of the QLQ-C30 scale, social functioning and emotional functioning scores were the lowest, with median scores of 16.7 (IQR: 0, 33.3) and 16.7 (IQR: 8.3, 25), respectively. Among the three symptom scales (fatigue, pain, nausea, and vomiting), the fatigue symptom score was the highest, with a median score of 77.7 (IQR: 66.7, 88.9). The details are shown in **Table 1**.

Table 1. Quality of life scores in various domains for patients with advanced lung cancer

Domains of quality of life	Scores
Physical functioning	20 (6.7, 16.7)
Role functioning	33.3 (16.7, 50)
Emotional functioning	16.7 (8.3, 25)
Cognitive functioning	33.3 (16.7, 50)
Social functioning	16.7 (0, 33.3)
Overall health status	66.67 (66.67, 100)
Fatigue	77.7 (66.7, 88.9)
Nausea and vomiting	33.3 (16.7, 50)
Pain	66.7 (50, 66.7)
Dyspnea (Shortness of breath)	100 (66.7, 100)
Insomnia (Sleep difficulties)	66.7 (66.7, 66.7)
Loss of appetite	66.7 (33.3, 100)
Constipation	66.7 (33.3, 100)
Diarrhea	0 (0, 0)
Financial difficulties	66.7 (66.7, 100)

3.3. Correlation analysis of quality of life, anxiety, and depression in patients with advanced lung cancer

The results of Spearman correlation analysis showed a positive correlation between anxiety scores and depression scores in patients with advanced lung cancer ($P < 0.01$). However, there was no correlation between the quality of life and anxiety or depression scores in patients with advanced lung cancer ($P > 0.1$). **Table 2** presents the results.

Table 2. Correlation analysis of quality of life, anxiety, and depression in patients with advanced lung cancer

Items	Anxiety score	Depression score	Quality of life score
Anxiety score	1.000		
Depression score	0.665**	1.000	
Quality of life score	0.057	0.170	1.000

Note: ** Significantly correlated at the 0.01 level (bilateral).

3.4. Multiple regression analysis of quality of life in patients with advanced lung cancer

Factors that were statistically significant in the univariate analysis were included as potential influencing factors in the regression equation. Multiple regression analysis was performed, with quality of life as the dependent variable and gender, age, occupational status, education level, religious belief, marital status, family residence, disease stage, self-care ability, disease nature, whether chemotherapy was received, anxiety, and depression scores as independent variables. The results showed that patients' self-care ability, disease nature, and whether they received chemotherapy were independent influencing factors of quality of life, with statistically significant differences ($P < 0.001$). The results are shown in **Table 3**.

Table 3. Multiple regression analysis of quality of life in patients with advanced lung cancer

Items	B	Standard error	Beta	t	P
(Constant)	91.877	14.629		6.280	< 0.001
Depression	0.284	0.189	0.251	1.506	0.140
Anxiety	0.072	0.229	0.058	0.317	0.753
Patient gender	-0.484	1.991	-0.032	-2.243	0.809
Patient age	-1.189	1.844	-0.099	-0.645	0.523
Patient occupational status	-3.271	1.828	-0.266	-1.790	0.081
Patient education level	-1.442	1.420	-0.147	-1.015	0.316
Patient marital status	0.171	1.296	0.018	0.132	0.896
Patient family residence	2.238	1.829	0.179	1.223	0.229
Patient disease stage	-1.122	1.885	-0.084	-0.595	0.555
Patient self-care ability	3.983	1.346	0.419	2.959	< 0.05
Patient disease nature	-6.541	2.363	-0.388	-2.768	< 0.05
Whether the patient received chemotherapy	-5.986	2.402	-0.399	-2.492	< 0.05

4. Discussion and conclusion

4.1. Status quo of quality of life in patients with advanced lung cancer

According to the results, patients with advanced lung cancer have a lower quality of life, which is consistent with domestic research findings^[9]. The possible reasons are related to the disease itself. Patients with advanced lung cancer have a short life expectancy, declining physical function, and long-term conservative treatment. Most symptoms brought on by the disease are difficult to alleviate through treatment, causing patients to endure significant physical and emotional pain, thereby leading to a low quality of life. Among the five functional scales (physical, role, cognitive, emotional, and social functioning) of the quality of life questionnaire, social function and emotional function scores were the lowest. This may be because the majority of the subjects in this study are elderly patients who have lower levels of social support, which affects their quality of life to some extent^[10]. Among the three symptom scales (fatigue, pain, and nausea and vomiting), fatigue symptoms scored the highest, which is similar to domestic and international research results^[11,12]. Therefore, in addition to helping patients with advanced lung cancer address the symptoms caused by the disease, attention should also be paid to their social and emotional functions to improve their quality of life.

4.2. High incidence of anxiety and depression in patients with advanced lung cancer

This survey showed that all 51 patients with advanced lung cancer experience varying degrees of anxiety and depression. Among them, 10 cases are moderately depressed, accounting for 19.6%, and 41 cases are severely depressed, accounting for 80.4%. There are 21 cases of moderate anxiety, accounting for 41.2%, and 30 cases of severe anxiety, accounting for 58.8%. These results are higher than those found in studies by Ma *et al.* and Chang *et al.* [13,14]. Anxiety and depression are somewhat correlated and often coexist. There may be two reasons for this: Firstly, the sample size of this study is small, and most of the subjects come from rural areas with relatively poor economic status. Economic difficulties can exacerbate anxiety and depression in patients [15]. Secondly, medical staff may focus more on the physical problems of patients with advanced lung cancer and help them address symptomatic discomfort, while failing to timely assess and address their psychological issues, leading to anxiety and depression. In recent years, the psychological problems of patients with advanced cancer have become a key concern. Therefore, it is necessary to raise medical staff's awareness regarding the psychological state of patients with advanced lung cancer, improve nurses' ability to identify and evaluate anxiety and depression, quickly identify and provide effective nursing intervention measures, and reduce patients' anxiety and depression.

4.3. Factors influencing quality of life in patients with advanced lung cancer

The results of this study indicated that the quality of life of patients with advanced lung cancer is influenced by multiple factors. Patients' self-care ability, the nature of the disease, and whether they undergo chemotherapy are independent influencing factors of quality of life. However, the level of quality of life is not correlated with patients' anxiety and depression. The possible reasons are that most of the subjects in this study are over 60 years old, and their quality of life is more significantly affected by their physical symptoms; and the selected sample size is small, which poses certain limitations. Patients with poorer self-care ability have lower quality of life levels. This may be because advanced lung cancer leads to poor physical condition, poor diet and nutrition, and ineffective communication with family and friends, resulting in low quality of life. Patients who have undergone chemotherapy have a worse quality of life. Studies have shown that household economic status is a factor that affects physical function, role function, and overall health status, and causes economic difficulties. Patients with poorer economic status have lower scores on the above functions, indicating a poorer quality of life [11]. The quality of life level of patients with advanced lung cancer who undergo chemotherapy is lower than that of patients who do not receive chemotherapy. Research has shown that the chemotherapy period for cancer patients is closely related to other symptoms, and they are prone to distress and fatigue, which has a greater impact on quality of life [16]. Therefore, to improve the quality of life of patients with advanced lung cancer, effective nursing intervention should be provided early.

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Disclosure statement

The authors declare no conflict of interest.

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