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Analysis of the Mediating Effect of Psychological Flexibility on Death Anxiety and Quality of Life in Cancer Patients

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Abstract: *Objective*: To analyze the mediating effect of psychological flexibility between death anxiety and quality of life in cancer patients. *Methods*: A convenience sampling method was used to select cancer patients who received treatment at our hospital from January 2022 to January 2024, by the inclusion and exclusion criteria. General information, psychological flexibility, death anxiety, and quality of life scores were collected for analysis. *Result*: The psychological flexibility and quality of life scores of cancer patients with an annual family income ≤ 100,000 RMB were significantly lower than those of cancer patients with an annual family income > 100,000 RMB ($P < 0.05$), while the death anxiety scores were significantly lower for the former group as well ($P < 0.05$). Cancer patients staged as I-II had significantly higher psychological flexibility and quality of life scores than those staged as III-IV ($P < 0.05$), while their death anxiety scores were significantly lower ($P < 0.05$). Psychological flexibility in cancer patients was negatively correlated with death anxiety ($r = -0.614$, $P < 0.05$) and positively correlated with quality of life ($r = 0.628$, $P < 0.05$), while death anxiety was negatively correlated with quality of life ($r = -0.112$, $P < 0.05$). The direct effect of death anxiety on quality of life was -0.232, accounting for 58.32% of the total effect. The mediating effect of psychological flexibility between death anxiety and quality of life was -0.218, accounting for 41.83% of the total effect. *Conclusion*: Death anxiety can directly affect the quality of life of cancer patients, and it can also indirectly affect the quality of life through psychological flexibility. Clinicians should promptly address patients' death anxiety and provide interventions to enhance psychological flexibility, thereby improving the quality of life.

Keywords: Psychological flexibility; Cancer patients; Death anxiety; Quality of life; Mediating effect

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1. Introduction

According to the latest data from the International Agency for Research on Cancer [1], there were approximately 19.29 million new cancer cases worldwide in 2020, with breast cancer ranking first at 2.26 million cases. With

the continuous advancement of early screening methods and modern diagnostic and treatment technologies, cancer patients' survival rates have been steadily increasing [2]. Death anxiety is a psychological state or reaction that individuals experience when facing major threats such as death. It can be either conscious or unconscious. Death anxiety persists throughout the entire course of malignant tumors, significantly affecting patients' quality of life and both physical and mental health [3]. Psychological flexibility is closely linked to quality of life and other positive outcomes. Studies have shown that good psychological flexibility can significantly improve anxiety, depression, social functioning, and quality of life in patients with chronic pain. Therefore, this study analyzes the mediating effect of psychological flexibility on the relationship between death anxiety and quality of life in cancer patients, providing valuable clinical insights.

2. Data and methods

2.1. General information

A convenience sampling method was used to select cancer patients who received treatment at our hospital from January 2022 to January 2024, according to inclusion and exclusion criteria. This study has been approved by the Ethics Committee and strictly follows ethical principles in medical research and clinical trial regulations. Previous literature suggests that the sample size for structural equation modeling should be no less than 220 cases [4]. Therefore, a total of 300 questionnaires were distributed, and 277 valid questionnaires were collected, with a valid response rate of 92.33%.

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) Patients aged ≥ 18 years; (2) Patients who voluntarily participate in this questionnaire survey; (3) Patients who can communicate normally; (4) Patients with stable conditions; (5) Patients diagnosed with malignant tumors through pathology and hospitalized.

Exclusion criteria: (1) Patients with combined cognitive impairments; (2) Patients with mental disorders.

2.3. Survey methods

The survey collection work is completed personally by the researcher. First, the researcher contacts the relevant departments and responsible individuals, and after obtaining consent, they enter the department. The researcher reviews patient medical records to collect basic information and further determines if the patient meets the inclusion criteria for the study. After completing the information collection, the researcher enters the inpatient department to find eligible patients and their spouses for the survey. The online questionnaire is distributed via Wenjuanxing, and the researcher provides timely explanations of any unclear items and instructions on completing the survey. This ensures the smooth progress of the survey, and once the questionnaires are completed, they are collected. The survey collection work is conducted during the patients' untreated periods, and in an environment with relatively few fellow patients, to minimize any external factors that might influence the results of the survey filled out by the patients and their spouses.

2.4. Data collection

2.4.1. General information

After reviewing the literature and consulting experts, a self-designed general information questionnaire was

created, including age, gender, educational level, marital status, annual household income, tumor location, and tumor staging.

2.4.2. Psychological flexibility

The psychological flexibility of patients in this study was assessed using the Commitment Action Questionnaire (CAQ) [5]. This questionnaire consists of two dimensions: a positive dimension and a negative dimension. It contains a total of eight items, rated on a Likert scale from 0 to 6, with a maximum score of 48 points. Higher scores indicate greater psychological flexibility, while lower scores suggest reduced flexibility.

2.4.3. Death anxiety (T-DAS)

The death anxiety of the patients in this study was assessed using the Death Anxiety Scale [6]. The questionnaire consists of 4 dimensions with a total of 15 items, scored as 'yes' or 'no,' with 1 point for 'yes' and 0 points for 'no.' The total score is 15 points. A higher score indicates greater death anxiety, and a score of 7 or more indicates the presence of death anxiety in the patient.

2.4.4. Quality of life (SF-36)

The SF-36 scale is used to assess patients' quality of life before and after intervention [7]. This scale consists of 9 dimensions with a total of 36 items. Most items are rated using a Likert scale from 1 to 5, while a few are scored on a 2-level or 3-level scale. After recording the scores, they are converted proportionally into standardized scores on a 100-point scale. Higher scores indicate a better quality of life, whereas lower scores suggest a poorer quality of life.

2.5. Statistical methods

All the collected data were entered into SPSS 25.0 software for statistical analysis. For categorical data, the recording method was by frequency and percentage, and analysis was performed using χ^2 tests and other methods. For continuous data, the recording method was by mean and standard deviation, and analysis was conducted using t-tests. Pearson correlation analysis and structural equation modeling were used to analyze correlations and interactions. A P-value of < 0.05 was considered statistically significant.

3. Results

3.1. Psychological flexibility, death anxiety, and quality of life scores in cancer patients under different factors

Table 1 shows the analysis of psychological flexibility, death anxiety, and quality of life in cancer patients of different ages, genders, education levels, marital statuses, annual family incomes, tumor locations, and cancer stages reveals significant differences. The results show that psychological flexibility, death anxiety, and quality of life scores differ significantly based on family income and cancer stage ($P < 0.05$). Cancer patients with an annual family income ≤ 100,000 yuan have significantly lower psychological flexibility and quality of life scores compared to those with an income > 100,000 yuan, while their death anxiety scores are significantly lower than those with an income > 100,000 yuan. Cancer patients with stage I-II tumors have significantly higher psychological flexibility and quality of life scores than those with stage III-IV tumors, while their death anxiety

scores are significantly lower than those with stage III-IV tumors.

Table 1. Psychological flexibility, death anxiety, and quality of life scores in cancer patients under different factors

Variable	Group	*n*	CAQ	T-DAS	SF-36
Age	≤ 40	65	12.62 ± 3.28	7.33 ± 1.22	73.56 ± 5.33
	40–60	110	12.77 ± 3.11	7.45 ± 1.93	74.96 ± 5.22
	≥ 60	102	12.31 ± 3.56	7.31 ± 1.98	74.69 ± 5.19
F			0.297	0.447	1.676
P			0.766	0.655	0.096
Gender	Man	160	12.74 ± 3.55	7.49 ± 1.87	74.56 ± 5.19
	Woman	117	12.40 ± 3.42	7.23 ± 1.75	74.24 ± 5.95
t			0.800	1.175	0.476
P			0.425	0.241	0.634
Educational level	High school and below	157	12.63 ± 3.06	7.39 ± 1.59	74.73 ± 5.35
	College or above	120	12.51 ± 3.84	7.33 ± 1.37	74.07 ± 5.44
t			0.289	0.330	1.010
P			0.772	0.742	0.313
Marital status	Married	197	12.77 ± 3.33	7.36 ± 1.85	73.79 ± 5.31
	Unmarried or widowed	80	12.37 ± 3.82	7.28 ± 1.71	75.01 ± 5.19
t			0.868	0.333	1.744
P			0.386	0.739	0.082
Annual household income	≤ 100,000 yuan	169	11.13 ± 3.68	7.87 ± 1.85	70.25 ± 5.22
	> 100,000 yuan	108	14.01 ± 4.11	6.85 ± 1.49	78.55 ± 5.43
t			6.067	4.817	12.706
P			0.000*	0.000*	0.000*
Tumor site	Head and neck	52	12.63 ± 3.05	7.45 ± 1.85	74.65 ± 5.55
	Mammary gland	32	12.62 ± 3.11	7.39 ± 1.42	73.16 ± 5.37
	Respiratory system	61	12.55 ± 3.56	7.43 ± 1.33	74.44 ± 5.49
	Digestive system	48	12.56 ± 3.78	7.38 ± 1.19	74.19 ± 5.29
	Urinary system	11	12.61 ± 3.46	7.31 ± 1.09	74.95 ± 5.11
	Other	73	12.45 ± 1.85	7.32 ± 1.22	75.01 ± 5.06
F			0.017	0.195	1.248
P			0.986	0.846	0.215
Tumor staging	I-II	196	10.22 ± 3.11	7.91 ± 1.72	76.24 ± 5.44
	III-IV	81	14.92 ± 3.99	6.81 ± 1.26	72.56 ± 5.62
t			10.497	5.205	5.072
P			0.000*	0.000*	0.000*

3.2. Analysis of the relationship between psychological flexibility, death anxiety, and quality of life in cancer patients

Table 2 shows that the psychological flexibility of cancer patients is negatively correlated with death anxiety (r = -0.614, $P < 0.05$) and positively correlated with quality of life (r = 0.628, $P < 0.05$). Death anxiety in cancer patients is negatively correlated with quality of life (r = -0.112, $P < 0.05$).

Table 2. Analysis of the relationship between psychological flexibility, death anxiety, and quality of life in cancer patients

	CAQ	T-DAS	SF-36
CAQ	1		
T-DAS	-0.614*	1	
SF-36	0.628*	-0.112*	1

Note: * is $P < 0.05$.

3.3. Analysis of the mediating effect of psychological flexibility on the relationship between death anxiety and quality of life in cancer patients

To further analyze the mediating effect of psychological flexibility between death anxiety and quality of life in cancer patients, this study employed the Bootstrap method in SPSS to examine the mediating effect of psychological flexibility on death anxiety and quality of life. A 95% confidence interval (CI) that includes 0 indicates a significant mediating effect, while an interval that does not include 0 indicates a non-significant mediating effect. The results of this study show that, with death anxiety as the independent variable, psychological flexibility as the mediating variable, and quality of life as the dependent variable, there is a significant negative correlation between psychological flexibility and death anxiety, and a significant positive correlation between psychological flexibility and quality of life. The direct effect of death anxiety on quality of life is -0.232, with a 95% CI that does not include 0, accounting for 58.32% of the total effect. The mediating effect of psychological flexibility between death anxiety and quality of life is -0.218, with a 95% CI that does not include 0, confirming the mediating role of psychological flexibility, which accounts for 41.83% of the total effect, indicating a partial mediating effect shown in **Table 3** and **Figure 1**.

Table 3. Analysis of the mediating effect of psychological flexibility on the relationship between death anxiety and quality of life in cancer patients

Project	Effect value	Standard error	95% CI		Effect proportion (%)
			Lower limit	Upper limit	
Total effect	-0.322	0.037	-0.368	-0.136	100
Direct effect (death anxiety → quality of life)	-0.232	0.053	-0.433	-0.136	58.32
Indirect effects (death anxiety → psychological flexibility → quality of life)	-0.218	0.028	-0.293	-0.082	41.83

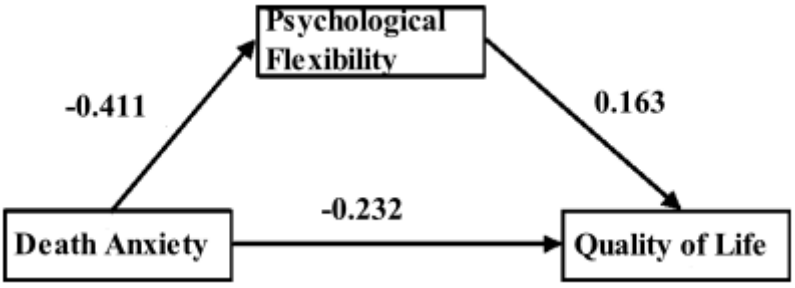

Figure 1. Path diagram of the mediating effect of psychological flexibility of cancer patients between death anxiety and quality of life

4. Discussion

The torment of cancer and the constant threat of death cause most cancer patients to lose confidence and hope in life and treatment, severely affecting their quality of life. Death anxiety, as a negative psychological state directly linked to death, persists throughout the entire course of a cancer patient's illness. A high level of death anxiety can immerse patients in negative emotions of fearing impending death, thereby impairing their coping abilities and severely damaging their physical and mental health, ultimately affecting their prognosis. Psychological flexibility is closely related to mental health and plays a crucial mediating role. It is of great significance to an individual's daily well-being and long-term psychological health.

In this study, the average death anxiety score of cancer patients was (7.36 ± 1.42), indicating the presence of death anxiety. After the cancer diagnosis, patients not only have to endure the physical discomfort caused by the disease itself and the trauma of surgery, but also face the looming threat of death. The average score for psychological flexibility was (12.57 ± 1.66), which is relatively low compared to Akerblom's study [8], possibly due to differences in the research subjects. Akerblom's study focused on patients with chronic pain, whereas the subjects of this study were cancer patients, who, due to the impact of their condition, generally exhibit lower psychological flexibility.

The results of this study also show that there are significant differences in psychological flexibility, death anxiety, and quality of life scores among cancer patients with different household annual incomes and tumor stages ($P < 0.05$). After being diagnosed with cancer, patients experience stress due to the need for treatment and ongoing maintenance costs. Unemployment or reduced income further intensifies this pressure. In addition to enduring the suffering of the disease, patients also face the economic burden of medical expenses, which can, to some extent, affect their decision-making behaviors. Patients with more advanced tumor stages bear greater treatment and disease-related pressures, and the impact on psychological flexibility, death anxiety, and quality of life scores is also more significant for those at later stages [9].

Psychological flexibility is negatively correlated with death anxiety and positively correlated with quality of life, while death anxiety is negatively correlated with quality of life ($r = -0.112$, $P < 0.05$). Death anxiety can directly impact the quality of life in cancer patients and can also indirectly affect their quality of life through psychological flexibility. When cancer patients face death anxiety, they often adopt avoidance strategies, unwilling to accept the reality of their illness, excessively dwelling on their past healthy state, which leads to psychological rigidity and a decrease in psychological flexibility [10,11]. Additionally, during treatment, cancer patients often worry

that the poor prognosis of the disease will impose a serious burden on their families, leading to feelings of guilt and shame. This negative psychological state can be magnified as the disease progresses, draining their positive psychological energy and causing the emergence of inflexible behavioral patterns [12].

When cancer patients attempt to reduce negative emotions such as anxiety and depression by avoiding them, they become more likely to recall painful experiences. Individuals with higher levels of psychological flexibility tend to adopt an open and accepting coping approach [13]. This approach can help patients clarify their life values and goals, develop practical plans guided by the right values, take effective actions, actively engage in self-management, and ultimately improve their quality of life [14–17].

Healthcare professionals should use psychological flexibility as a starting point, constructing intervention strategies based on cognitive behavioral therapy, acceptance and commitment therapy, and other methods [18]. These strategies aim to strengthen death education for patients and their families, correct misconceptions about cancer and death, encourage patients to express negative emotions, and motivate them to adopt positive coping strategies, ultimately improving their quality of life [19,20].

5. Conclusion

Death anxiety can directly affect the quality of life of cancer patients, and it can also indirectly affect the quality of life through psychological flexibility. Clinicians should promptly address patients' death anxiety and provide interventions to enhance psychological flexibility, thereby improving the quality of life.

Disclosure statement

The authors declare no conflict of interest.

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