



BMJ Open Factors influencing death anxiety among Chinese patients with cancer: a cross-sectional study

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ABSTRACT

Objective The purpose of this study was to investigate death anxiety status among Chinese patients with cancer and identify factors that affect death anxiety.

Design Cross-sectional study.

Setting Changsha, Hunan Province, China.

Participants A total of 286 inpatients diagnosed with cancer were randomly recruited from a tertiary cancer centre and completed the questionnaires between January and June 2021.

Primary and secondary outcome measures The primary outcome was the status of death anxiety. The secondary outcomes were the factors that affect death anxiety among Chinese patients with cancer.

Methods A total of 286 Chinese patients with cancer were recruited from a tertiary cancer hospital to complete the demographic and clinical characteristics questionnaire, Templer's Death Anxiety Scale, Acceptance and Action Questionnaire-second edition, and Meaning in Life Questionnaire from January to June 2021. Data were analysed using t-test, analysis of variance, Kruskal-Wallis H test, Pearson correlation analysis and multiple linear regression analysis.

Results On average, patients with cancer scored 7.72±4.17 for death anxiety, 25.71±9.69 for experiential avoidance and 45.19±8.22 for meaning in life. Ultimately, the statistically significant factors influencing death anxiety were education levels, insurance, pain scores, experiential avoidance and meaning in life. These factors explained 40.6% of the difference in death anxiety.

Conclusions Patients with cancer in China experienced a high level of death anxiety. This study showed that experiential avoidance and meaning in life were important factors that affected death anxiety in patients with cancer. Further studies should be conducted to explore effective interventions to prevent experiential avoidance and increase meaning in life for patients with cancer. Attention should be paid to patients without insurance but with lower education levels and higher pain scores to ultimately relieve death anxiety and improve their quality of life.

INTRODUCTION

Cancer mobility and mortality have increased continuously worldwide as the global population grows and ages.¹ The GLOBOCAN 2020 database estimated that there were 19.3 million new cancer cases

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Multiple methodologies including univariate analysis and multivariate linear regression were used to identify the factors that affect death anxiety among Chinese patients with cancer.
- ⇒ Due to the cross-sectional nature of this study, we were not able to examine longitudinal changes in death anxiety experienced by patients with cancer.
- ⇒ The study sample was selected from a single cancer hospital; therefore, the results may not be generalised to patients with cancer in other settings.

and approximately 10 million deaths from cancer in 2020.² According to the latest data from the Chinese National Cancer Registry, cancer has become the leading cause of death in China over the past half-century, with increased cancer cases and deaths.³ Cancer is a life-threatening disease that can negatively affect patients, and there is no doubt that patients' physical and mental health deteriorates immediately after diagnosis and persists throughout the treatment process.⁴

Death anxiety (DA) is a concept used to describe the fear of death,⁵ and is described as a negative feeling of attitudes and cognition associated with death or dying.⁶ Patients who were diagnosed with a life-threatening disease, such as cancer, can experience DA and stress. Patients with advanced cancer are more likely to suffer from DA, with 81% of patients with breast cancer suffering from distressing thoughts about death.⁷ DA can cause mental disorders⁸ and may hinder advance care planning⁹ and preparation for the end of life.¹⁰

It is essential to investigate the factors that influence DA in patients to provide the basis for better supportive intervention in patients with DA. Various demographic variables, such as age, religion, education and gender, have been discovered to impact DA in previous research.¹¹ In addition to these demographic variables, studies investigating factors related

to DA in Chinese patients mainly focused on self-esteem,¹² coping mode¹³ and the sense of meaning.¹³ Avoidance is a negative strategic coping mode that causes patients to experience more negative physical and psychological outcomes. Experiential avoidance (EA) is the refusal to consider or remember unpleasant experiences, memories or thoughts.¹⁴ Patients in the avoidance mode are likely to suffer from more severe physical symptoms and mental illness. The acceptance of death can increase the acceptance of negative thoughts and emotions, but patients with avoidance coping strategies have lower DA.¹⁵ Meaning in life (MIL) was defined as an individual's subjective sense of meaning, including the understanding of life circumstances, purpose and significance.¹⁶ In recent years, MIL has increasingly been investigated in patients with cancer.¹⁷ The Meaning Management Theory (MMT) provides a conceptual framework and guidelines on how to facilitate death acceptance and meaning in living as an indirect but effective way to combat DA.¹⁸ MMT also points out that being more aware of life's meaning and purpose can influence individuals' attitudes and behaviours associated with death or dying and improve their MIL; individuals who perceive greater MIL can accept death and thus experience less fear of death.¹⁹ China has its unique social culture, social conventions and social appropriateness. In traditional Chinese culture, people generally believe that death is a taboo topic, and patients with cancer are even more reluctant to talk about death, thinking that the word 'death' will bring bad luck to them. Therefore, the DA in Chinese patients with cancer may present unique features. However, the level and associated influencing factors of DA among Chinese patients with cancer have rarely been investigated, which affects the formulation and effectiveness of tailored interventions for DA. The hypothesis is that higher levels of EA and lower levels of MIL are associated with a higher risk of DA. This study aims to investigate the levels of DA among Chinese patients with cancer, and to identify factors that affect DA.

METHODS

Participants

This cross-sectional descriptive study was conducted from 1 January to 30 June 2021. Inpatients diagnosed with cancer were randomly recruited from a tertiary cancer centre in Changsha, Hunan, China. Inclusion criteria were as follows: (a) patients were already informed of their disease diagnosis; (b) patients aged ≥ 18 years who had competent language communication capability; (c) voluntary participation in the survey under the principle of informed consent. Exclusion criteria included were as follows: (a) patients who failed to complete questionnaires; (b) patients who were cognitively impaired or had mental disorders. G-Power analyses with an effect size of 0.15, a significance level of 0.05 and a power of 0.99 were performed, indicating that a minimum of 125 participants were needed. We recruited 300 participants, 14 of

whom did not complete the questionnaire, leaving the final analysis to include 286 (95%) of them.

Measures

The self-designed demographic and clinical characteristics questionnaire included demographic characteristics (gender, age, ethnicity, education level, marital status, occupation, place of residence, income, insurance and religion), as well as clinical characteristics (cancer position, cancer stage, with pain or not, and pain score). The demographic characteristics were collected from participants by researchers, while clinical data were gathered from the computerised medical records of the hospital.

The DA of patients was measured using the Chinese version of the Templer's Death Anxiety Scale (T-DAS), which was developed by Templer in 1970²⁰ and modified by Yang.²¹ The items are rated on a 2-point Likert-type scale with 15 questions, and the total score ranges from 0 to 15 points. Higher scores reflect higher levels of DA. The test-retest reliability of the T-DAS was 0.831, and the internal consistency of Cronbach's α was 0.73.²¹

The EA of patients was assessed using the Chinese version of the Acceptance and Action Questionnaire-second edition (AAQ-II), which was originally developed by Bond *et al* in 2011 and translated into a Chinese-specific context by Cao *et al* in 2013.^{22 23} There are seven Likert scale items scored from 1 (never) to 7 (always), with a total score of 7–49. Higher scores indicate higher levels of EA and lower levels of psychological flexibility. The Cronbach's α was 0.88 and the test-retest reliability was 0.80.²³

The Chinese version of the Meaning in Life Questionnaire (MLQ) was used in this study. The original version contains 10 items that have been translated into Chinese with one item deleted.^{24 25} The Chinese version of the MLQ consists of two subscales: the presence of MIL (five items) and the search for MIL (four items). Each item is rated on a 7-point Likert scale scored from 1 (strongly disagree) to 7 (strongly agree). Cronbach's α values were 0.72 for the search for MIL subscale and 0.81 for the presence of MIL subscale for the MIL.²⁵

Statistical analysis

All data were analysed by IBM SPSS Statistics for Windows (V.25.0; IBM Corp). Demographic and clinical characteristics of patients with cancer were reported as means, SDs, frequencies and percentages. Univariate analysis was performed using t-test, analysis of variance, and Kruskal-Wallis H test to evaluate the relationship between patients' demographic and clinical characteristics and their DA scores, and $p < 0.05$ was considered statistically significant. The correlation between DA, EA and MIL among patients with cancer was determined using Pearson correlation analysis. All factors with a statistically significant relationship with the dependent variable in the univariate analysis were selected and included in the multiple linear regression analysis to explore the main influencing factors of DA.

Table 1 Demographic and clinical characteristics of patients (n=286)

Demographic characteristics	n (%)	Score (M±SD)	t/F/H	P value
Gender			-1.165*	0.246
Male	141 (49.3)	7.43±4.445		
Female	145 (50.7)	8.00±3.884		
Age (years)			3.562†	0.313
18~	32 (11.2)	8.94±3.331		
40~	151 (52.8)	7.44±4.129		
60~	93 (32.5)	7.76±4.562		
75~	10 (3.5)	7.60±3.098		
Nationality			1.067*	0.287
Han Chinese	260 (90.9)	7.80±4.138		
National minority	26 (9.1)	6.88±4.502		
Educational level			8.312‡	<0.001
Primary school or below	80 (28.0)	8.80±4.244		
Middle school	112 (39.2)	7.63±4.020		
High school	43 (15.0)	8.65±4.088		
College or above	51 (17.8)	5.41±3.579		
Marital status			2.508†	0.285
Unmarried	10 (3.5)	7.50±4.790		
Married	251 (87.8)	7.61±4.234		
Divorced/widowed	25 (8.7)	8.92±3.121		
Occupation			2.368†	0.668
White collar	51 (17.8)	7.06±3.574		
Worker	62 (21.7)	7.66±4.016		
Farmer	83 (29.0)	8.20±4.450		
Retired	30 (10.5)	7.53±4.840		
Unemployed	60 (21.0)	7.75±4.103		
Place of residence			-3.369*	0.001
Urban	127 (44.4)	6.80±4.014		
Rural	159 (55.6)	8.45±4.165		
Income (per month, RMB)			13.824†	0.008
<1000	12 (4.2)	8.00±1.477		
1000~	125 (43.7)	8.69±4.075		
3000~	120 (42.0)	6.86±4.444		
5000~	22 (7.7)	7.23±3.766		
>10 000	7 (2.4)	6.14±0.378		
Insurance			36.300†	<0.001
Basic medical insurance for urban residents	53 (18.5)	8.68±4.278		
Basic medical insurance for urban employees	72 (25.2)	5.75±3.471		
New cooperative medical system	149 (52.1)	8.32±4.057		
Commercial insurance	6 (2.1)	3.17±3.545		
Self-funded	6 (2.1)	12.50±1.643		
Religion			1.640*	0.113
No	264 (92.3)	7.81±4.220		
Yes	22 (7.7)	6.55±3.419		
Cancer position			0.307‡	0.909

Continued

Table 1 Continued

Demographic characteristics	n (%)	Score (M±SD)	t/F/H	P value
Head and neck	51 (17.8)	8.08±4.681		
Intracranial	21 (7.3)	7.52±4.633		
Breast	64 (22.4)	8.02±3.735		
Respiratory system	63 (22.0)	7.25±4.258		
Digestion system	74 (25.9)	7.65±4.019		
Urinary/reproductive system	13 (4.6)	7.77±4.362		
Cancer stage			11.338†	0.010
I	18 (6.3)	6.50±3.276		
II	95 (33.2)	7.41±3.811		
III	133 (46.5)	7.51±4.470		
IV	40 (14.0)	9.68±3.866		
With pain or not			-4.065*	<0.001
No	146 (51.0)	6.76±3.828		
Yes	140 (49.0)	8.71±4.295		
Pain score			37.503†	<0.001
0	146 (51.0)	6.76±3.828		
1~	91 (31.8)	7.51±4.438		
4~	46 (16.2)	11.00±3.011		
≥7	3 (1.0)	10.33±1.155		

*t value.
†H value.
‡F value.
RMB, renminbi.

Patient and public involvement

The patient and the public were not involved in the conduct of the study.

RESULTS

Participant characteristics

Table 1 shows the details of the demographic and clinical characteristics of the participants. Among the 286 participants, the mean age was 55.57±11.81 years. A total of 50.7% of the patients were female, 90.9% were Han Chinese, 87.8% were married, 55.6% lived in rural areas and 92.4% of the participants had no religious affiliation.

In terms of clinical characteristics at the time of diagnosis, 18 cases (6.3%) were stage I, 95 patients (33.2%) were stage II, 133 cases (46.5%) were stage III and 40 cases (14.0%) were stage IV.

Descriptive statistics and intercorrelation of variables

The average total values on questionnaires such as T-DAS, AAQ-II and MLQ are shown in table 2. More specifically, the mean score of DA was 7.72±4.17, the mean score of EA was 25.71±9.69 and the mean score of MIL was 45.19±8.22. The mean values of the MIL subscales were 25.42±4.92 and 19.77±4.23 for the presence of MIL and search for MIL, respectively.

Table 2 Descriptive statistics and the intercorrelation of variables

	1	2	3	4	5	Mean	SD
1. DA	1					7.72	4.17
2. EA	0.549**	1				25.71	9.69
3. Presence of MIL	-0.426**	-0.391**	1			25.42	4.92
4. Search for MIL	-0.213**	-0.180**	0.613**	1		19.77	4.23
5. MIL	-0.364**	-0.326**	0.914**	0.881**	1	45.19	8.22

**P<0.01.
DA, death anxiety; EA, experiential avoidance; MIL, meaning in life.

Table 3 Assignment of independent variables

Variables	Assignment method
Education level	0=primary school and below, 1=middle school, 2=high school, 3=college and above
Place of residence	0=urban, 1=rural
Income (per month, RMB)	0=<1000, 1=1000~, 2=3000~, 3=5000~, 4=>10 000
Insurance	Basic medical insurance for urban residents (Z1=1, Z2=0, Z3=0, Z4=0), basic medical insurance for urban employees (Z1=0, Z2=1, Z3=0, Z4=0), new cooperative medical system (Z1=0, Z2=0, Z3=1, Z4=0), commercial insurance (Z1=0, Z2=0, Z3=0, Z4=1), self-funded (Z1=0, Z2=0, Z3=0, Z4=0)
Cancer stage	0=stage I, 1=stage II, 2=stage III, 3=stage IV
With pain or not	0=no, 1=yes
Pain score	Measure value
EA	Measure value
MIL	Measure value

EA, experiential avoidance; MIL, meaning in life; RMB, renminbi.

The correlations of DA, EA and MIL in Chinese patients with cancer are shown in [table 2](#). DA was negatively correlated with presence of MIL ($r=-0.426$, $p<0.05$), search for MIL ($r=-0.213$, $p<0.05$) and MIL ($r=-0.364$, $p<0.05$), and positively correlated with EA ($r=0.549$, $p<0.05$). Similarly, EA was negatively correlated with presence of MIL ($r=-0.391$, $p<0.05$), search for MIL ($r=-0.180$, $p<0.05$) and MIL ($r=-0.326$, $p<0.01$).

Univariate analysis

Results in [table 1](#) showed that DA of patients with cancer was significantly correlated with their educational level ($p<0.001$), place of residence ($p=0.001$), income ($p=0.008$), insurance ($p<0.001$), cancer stage ($p=0.010$), with pain or not ($p<0.001$) and pain scores ($p<0.001$). Patients with cancer with a college or above educational level had lower scores than the ones with a high school or below educational level. Patients living in rural areas had higher mean DA scores, and high income was associated with lower DA scores. Patients who paid their medical expenses themselves (self-funded) scored higher than

patients with cancer with medical insurance. Patients with advanced cancer had higher mean DA scores. Patients with pain or higher pain scores were associated with higher DA scores. We did not find significant differences in DA scores by gender, age, nationality, marital status, occupation, religion or cancer position.

Multivariate analysis

We conducted multiple linear regressions with total DA score as the dependent variable and education level, place of residence, income, insurance, cancer stage, with pain or not, pain score, EA score and MIL score as the independent variables. The specific assignment for variables is shown in [table 3](#). Results of the multiple linear regression analysis suggested that education level, insurance, pain score, EA and MIL were related to DA scores, accounting for 40.6% of the variance ([table 4](#)).

DISCUSSION

The objective of this study was to evaluate the status of DA and the factors associated with DA in Chinese patients with cancer. Toward this end, we investigated DA according to patient demographic and clinical characteristics, levels of DA, EA and MIL, the relationships between DA, EA and MIL, and explored which factors can influence DA.

The results of this study suggested that the average score of DA was 7.72. In this study, patients with cancer in China experienced high levels of DA, based on the criterion that a score of more than 7 suggests a high level of DA. Over the same period, the mean score of DA in the general population was about 2.77.²⁶ These results indicated that the participants in our study had a higher level of DA than the general population.²⁷ Because higher levels of DA can lead to distressing thoughts about death and affect the recovery of patients, it is necessary to develop interventions to reduce their fear of death and deal with their impending death.

To our knowledge, this is the first study to investigate DA status and identify EA and MIL as influencing factors of DA among Chinese patients with cancer. It provides a new perspective to developing interventions aimed at

Table 4 Multiple linear regression analysis of DA

Variable	B	SE	β	T	P value
Constant term	10.006	2.028	–	4.933	<0.001
EA	0.199	0.022	0.463	8.961	<0.001
MIL	-0.060	0.026	-0.118	-2.262	0.024
Education level	-0.434	0.217	-0.109	-2.006	0.046
Pain score	0.644	0.275	0.120	2.343	0.020
Basic medical insurance for urban residents	-1.946	1.402	-0.182	-1.388	0.166
Basic medical insurance for urban employees	-3.958	1.398	-0.412	-2.832	0.005
New cooperative medical system	-2.870	1.345	-0.344	-2.133	0.034
Commercial insurance	-6.474	1.877	-0.223	-3.449	0.001

F=22.687, $p<0.001$; determination coefficient $R^2=0.425$, adjusted $R^2=0.406$.
DA, death anxiety; EA, experiential avoidance; MIL, meaning in life.

alleviating DA in Chinese patients with cancer. In line with expectations, EA has significantly influenced the DA of Chinese patients with cancer. An earlier study also showed that the EA of patients with cancer is a significant predictor of their psychological status, and significantly related to the negative emotions of patients with cancer.²⁸ Given that Acceptance and Commitment Therapy (ACT) can reduce the avoidance of disgusting experiences and help patients accept unpleasant experiences,^{29,30} psychologists can provide more training programmes based on the ACT to decrease EA and increase psychological flexibility, helping patients accept negative disease-related changes and encouraging them to seek the benefits of their disease that could improve their quality of life.³¹

The study has shown that MIL of patients with cancer is negatively correlated with DA, with higher scores on the evaluation dimension of the MIL reflecting lower DA. Previous research has shown that MIL is negatively related to DA among older Chinese adults, and older adults with higher MIL scores could face death with optimism even in distress.³² Previously reported findings suggested that meaning-centred interventions can promote the presence of MIL and reduce the fear of death.¹⁶ Medical staff can help patients with cancer consolidate and enhance MIL by meaning-centred interventions to achieve important life goals and values, which will assist patients to increase the likelihood of positive outcomes and decrease the risk of negative outcomes.

In addition, we found that DA scores were significantly different between participants with different education levels ($p < 0.05$). It can be seen that the DA level was higher in patients with an educational level of primary school or below. This result made us think that the participants with lower education levels did not have sufficient knowledge of death to decide on accepting it as a part of life and showed strong fear of death when confronted with death.¹³ A previous study pointed out that higher education levels and social experience may help ease anxiety and depression about death.³³ Therefore, intervention programmes need to be developed to promote a positive view of their situation of patients with lower education levels, which can be achieved by using death education courses that allow patients with cancer to improve attitudes and decrease anxiety regarding death.³⁴

It was also found that the type of insurance was a factor that determined the DA level. Among patients with cancer with different types of insurance, the DA level of self-funded patients with cancer was the highest, suggesting that better medical reimbursement can relieve some of the burden of medical costs on patients, thereby allowing them to focus on their illnesses.³⁵ A study abroad also showed that patients with cancer with health insurance had lower levels of anxiety and depression.³⁶ Therefore, the DA of patients with cancer without insurance should be better reduced.

Numerous studies have shown that higher pain scores provide patients with cancer with more negative energy in their fight against cancer and induce DA in their

anticancer process.^{37,38} Pain places a heavy burden on patients and negatively impacts physical, psychological, social and spiritual life, and higher pain scores may cause poor clinical outcomes.³⁹ Similarly, Gonen *et al* reported that patients with DA have higher pain scores, and poor pain control can lead to anxiety, depression and even suicidal thoughts in patients with cancer.⁴⁰ Consequently, patients with cancer with higher pain scores should be given special attention.

These results are consistent with the previous study that did not find significant associations between DA and demographic and clinical characteristics such as age, cancer position and cancer stage.¹² It could be because most Chinese patients with cancer believe that cancer is incurable and may have a higher level of DA after being diagnosed with cancer.

Implications for practice

Patients with cancer in China experience high levels of DA, thus healthcare workers should pay more attention to patients with cancer with lower education levels, higher pain scores and no insurance, to ultimately relieve DA and improve their quality of life. The results demonstrate a greater sense of optimistic view of interventions for DA among Chinese patients with cancer. Therefore, medical practitioners can employ intervention research such as ACT and meaning-centred interventions as the most important strategies to help Chinese patients with cancer search for their MIL and reduce their EA to better cope with DA. As current research has demonstrated, patients might benefit from accepting death as an integral part of life and searching or presenting for meaning in the later stage of life.

Limitations

Some limitations of this study should be acknowledged. First, this research was a cross-sectional study, so we were not able to examine longitudinal changes in DA experienced by patients with cancer. Second, we used convenience sampling to select our study participants from only one cancer hospital in Hunan Province. Therefore, these findings may not be generalised to patients with cancer in other settings. Further research is needed to investigate DA in larger and diverse samples of patients with cancer, using more objective measurements and employing longitudinal designs to reveal causal relationships.

CONCLUSIONS

In this study, Chinese patients with cancer showed high levels of DA, and the factors affecting DA in these patients were education levels, insurance, pain scores, EA and MIL. Further studies should develop and provide effective interventions for Chinese patients with cancer across all disease trajectories to help them cope with EA and MIL. Attention should be paid to patients with lower education levels, no insurance and higher pain scores, to ultimately relieve DA and further improve their quality of life.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval The Institutional Research Board of Hunan Cancer Hospital approved this study (approval no. 2021-55) before data collection. There was no interference with participants completing the questionnaires. Investigators assisted participants who had difficulty completing questionnaires. A consent form was presented to each participant, explaining the objectives and significance of the study and requesting their signature.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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