

RESEARCH ARTICLE

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# Suicidal Ideation was Associated with Quality of Life Impairment of Patients with Lung Cancer: A Cross-Sectional Study in Vietnam

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## Abstract

**Objective:** This study aimed to measure the quality of life (QOL) of lung cancer patients and evaluate the relationship between QOL and suicidal ideation (SI) in a tertiary hospital in Vietnam. **Methods:** A cross-sectional study was conducted at Bach Mai Hospital in Hanoi, Vietnam. A total of 256 patients with lung cancer were recruited. The QOL of cancer patients was evaluated using the European Organisation for Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC QLQ-C30) version 3. Multivariate Tobit regression was employed to identify associations between SI and QOL. **Result:** Overall, the mean global health status score was  $58.3 \pm 15.8$ , and those with SI had significantly higher scores than those without SI. Regarding functional scales, patients with SI had significantly lower physical functioning ( $82.22 \pm 11.42$ ) compared to those without SI ( $90.58 \pm 11.90$ ) ( $p < 0.05$ ). Meanwhile, regarding symptom scales, scores for fatigue, nausea and vomiting, pain, insomnia, appetite loss, constipation, diarrhea, and financial difficulties among patients with SI were significantly higher than those without SI ( $p < 0.05$ ). In the multivariate analysis, having SI increased the role functioning score (Coef. = 9.41, 95% CI = 0.38-18.45) and diarrhea score (Coef. = 22.33, 95% CI = 2.05-42.60). **Conclusion:** This study indicated moderate QOL and perceived the lowest social functioning in lung cancer patients. SI was associated with role functioning scores and diarrhea scores. SI should be monitored and controlled regularly in this population during treatment to improve their QOL.

**Keywords:** Suicidal ideation- quality of life- lung cancer- EORTC QLQ-C30

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## Introduction

Suicide is a significant public health issue, affecting people in various psychological, social, and economic ways [1]. Each year, about 700,000 people die by suicide globally, with most cases occurring in low and middle-income countries [2]. The primary goal of the World Health Organization (WHO) Mental Health Action Plan 2013 to 2020 was to reduce various suicidal behaviors, including suicidal thoughts and actions, by 10% [3]. This issue is particularly serious among the elderly, who are at higher risk of dying by suicide [4]. Therefore, the risk of suicide in people with cancer is much higher than in the general population [5].

The main risk factors for suicide are suicidal ideation and suicide attempts [2]. People who have suicidal ideation (SI), meaning thoughts of being better off dead

or considering self-harm, are at a higher risk of attempting and potentially completing suicide within two years after disclosing these thoughts [6]. Previous systematic reviews have identified various risk factors for SI among cancer patients [1, 7]. Although not all cancer patients who die by suicide express SI beforehand, and not all who have SI attempt suicide, SI is generally seen as a critical factor in the intent to commit suicide [8].

Lung cancer has the highest mortality rate among cancers and is the most common cancer regardless of gender [9, 10]. Several factors can put psychological and social pressure on lung cancer patients, weakening their psychological defenses. These factors include high lethality, poor prognosis, significant symptom burden, and substantial economic strain [10]. Research has shown that 92.8% of lung cancer patients report symptoms of depression and anxiety [11]. These patients have a

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significantly higher risk of SI and suicide attempts, which should be closely monitored in clinical settings [1, 7, 12]. Suicidal ideation among individuals with lung cancer is a multifaceted issue influenced by various psychological, biological, and social factors. The cognitive suicide model emphasizes the importance of lowered self-esteem and self-efficacy in individuals prone to suicidal ideation [13]. This suggests that individuals facing the challenges of lung cancer may experience a decline in their self-perception and belief in their ability to cope with their situation, potentially leading to thoughts of suicide.

Lung cancer often leads to a decreased quality of life (QoL) [14]. Advances in lung cancer treatments have increased the number of long-term survivors, making their QoL an important consideration. The QoL of lung cancer patients is often impaired in emotional, physical, social, and cognitive domains, affecting their daily activities [14, 15]. While there are known associations between mental disorders like depression or anxiety and QoL in lung cancer patients [11, 16], there is limited evidence about the connection between SI and QoL. This study aimed to measure the QoL of lung cancer patients and evaluate the relationship between QoL and SI in a tertiary hospital in Vietnam.

## Materials and Methods

### *Study design*

A cross-sectional study was conducted at Bach Mai Hospital in Hanoi, Vietnam, from August 2021 to October 2022. Study patients had to be diagnosed with primary lung cancer using histopathological methods. Their overall health status, as measured by the ECOG Performance Status Scale, had to be  $\leq 2$  [17]. Additionally, patients needed to understand the questionnaires and communicate well with doctors. Individuals with neurocognitive disorders, specifically dementia, or those who chose not to participate were excluded from the study. The research used a convenient sampling method. A total of 270 individuals were recruited, and 256 successfully completed the questionnaire, resulting in a response rate of 94%. The study protocol was approved by the Institutional Review Board at Hanoi Medical University under Code 208/QD-DHYHN.

### *Data measurement and collection*

A standardized medical record template was created and tested on a group of five lung cancer patients who met the inclusion criteria. The content was revised based on patient feedback. During data collection, all participants followed a standardized protocol. After confirming their eligibility and inviting them to join the study, trained researchers interviewed the patients to gather their demographics, clinical characteristics, SI, mental disorders, and QoL.

The study included socio-demographic factors such as age, gender, living location (urban/rural), education (elementary school, secondary school, high school, college/university), and occupation (farmer, worker, officials, retiree, other); histopathological classification (small cell lung cancer, non-small cell lung cancer),

clinical stage classification (early stage, late stage), time since diagnosis (months: <1, 1–3, 4–6, 7–12, >12), and types of treatment (surgery, chemotherapy/radiotherapy, combined surgery & chemotherapy-radiotherapy, other). Pain levels were measured using a visual analogue scale ranging from 0 to 100. Pain severity was categorized as follows: 0–4 indicated no pain, 5–44 mild pain, 45–74 moderate pain, and 75–100 severe pain.

### *Quality of Life*

QOL was assessed using the European Organisation for Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC QLQ-C30) version 3. The QLQ-C30 is highly reliable and valid across different languages and cultures and is translated into over 110 languages [18, 19]. It consists of 30 items categorized into five functional scales (physical, role, emotional, social, and cognitive functioning), three symptom scales (fatigue, nausea/vomiting, and pain), and six single-item scales (dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties). It also includes a global health status item. Scores for each scale range from 0 to 100, with higher scores on the functional scales and Global Health Status indicating better functioning, and higher scores on symptom scales indicating greater symptom burden [20]. The Cronbach's alpha was 0.728, indicating acceptable reliability.

### *Suicidal Ideation*

The severity of suicidal ideation was assessed using the Columbia Suicide Severity Rating Scale (C-SSRS) [21]. Participants were asked about five levels of suicidal ideation ranging from 0 to 5, where 0 indicated no suicidal thoughts, 1 indicated a desire to die, and 5 indicated active suicidal ideation with a specific plan and intent. The Cronbach's alpha was 0.763, indicating acceptable reliability.

### *Anxiety and Depression*

The Hospital Anxiety and Depression Scale (HADS) was used to measure the severity of anxiety and depression. The HADS includes 14 questions, with seven items each for depression and anxiety. Each item is rated on a scale from 0 to 3, resulting in scores ranging from 0 to 21 for both depression and anxiety. Higher scores indicate more frequent symptoms. The study defined depressive syndrome as a score of 8 or higher on the depression scale and anxiety syndrome as a score of 8 or higher on the anxiety scale [22]. The Cronbach's alpha was 0.801, indicating acceptable reliability.

### *Statistical analysis*

The data analysis was conducted using SPSS software version 20.0. A descriptive statistical analysis was performed. The study used univariate and multivariate Tobit regression analysis to investigate the relationships between suicidal ideation (SI) and quality of life (QOL) in patients, while controlling for socio-demographic, clinical, and mental health variables. The criterion for statistical significance was set at a P-value of less than 0.05.

## Results

Out of 256 individuals, most were men (76.6%) and fell in the age range of 60-69 years (39.0%). The majority of the patients resided in urban regions (56.6%), had a high school level of education (61.3%), and worked as farmers (32.0%). In terms of clinical features, the majority of patients had non-small cell lung cancer, accounting for 93.4% of cases, and were diagnosed at an advanced stage, with 82.8% of patients presenting with late-stage cancer. Most participants (25.8%) had been diagnosed with lung cancer over a year ago, and a significant number (80.4%) had undergone chemotherapy or radiation therapy. The majority of patients (59.3%) experienced only slight discomfort. Regarding mental health, the prevalence of depression and anxiety were 15.0% and 20.3%, respectively. Additionally, 8.2% had suicidal ideation (Table 1).

Table 2 shows the differences across QOL domains. Overall, the mean global health status score was  $58.3 \pm 15.8$ , and those with SI had significantly higher scores than those without SI. Regarding functional scales, patients with SI had significantly lower physical functioning ( $82.22 \pm 11.42$ ) compared to those without SI ( $90.58 \pm 11.90$ ) ( $p < 0.05$ ). Meanwhile, scores in fatigue, nausea and vomiting, pain, insomnia, appetite loss, constipation, diarrhea, and financial difficulties were significantly higher among patients with SI compared to those without SI ( $p < 0.05$ ).

Table 3 shows associations between SI and different QOL domains using univariate and multivariate regression analysis. In the univariate model, having SI was negatively associated with global health status and physical functioning and positively correlated with fatigue, nausea and vomiting, pain, dyspnea, appetite loss, constipation, diarrhea, and financial difficulties. In the multivariate analysis, having SI increased the role functioning score (Coef.=9.41, 95% CI=0.38-18.45) and diarrhea score (Coef.=22.33, 95% CI=2.05-42.60).

## Discussion

Lung cancer is a global issue that significantly deteriorates patients' quality of life (QOL). This study adds to the literature on factors affecting the QOL of lung cancer patients. Our findings showed moderate QOL in this population, with the lowest scores in social functioning. Additionally, the impact of suicidal ideation (SI) on various QOL domains highlights the need to monitor and manage SI among lung cancer patients to improve their QOL.

Our study indicates that lung cancer patients generally maintain a favorable functional quality of life, with minimal complaints regarding symptoms and financial difficulties. Patients were able to sustain a relatively high level of physical, role, emotional, and cognitive functioning. These results are consistent with other studies worldwide [23, 24]. This may be due to the high educational attainment of the patients. However, social functioning scored the lowest, likely due to the significant impact of the disease on patients' ability to engage in

social activities and the financial burden it imposes on their families [20].

Physically, lung cancer patients in our study showed few severe symptoms, which aligns with the effective management of physical symptoms by oncologists. Previous studies have found that lung cancer patients often experience a diminished QOL characterized by dyspnea, fatigue, coughing, insomnia, appetite loss, and pain [24, 25]. Fatigue and diarrhea had the highest scores among symptoms. Prior research has shown a strong correlation between the need for psychosocial support and high fatigue scores [26]. Cancer-related fatigue, a prevalent symptom, remains an unmet need among cancer patients [27]. It can manifest at diagnosis, during treatment, and post-treatment, reducing overall QOL [28].

Our study found that individuals with SI generally had a lower QOL compared to those without SI, particularly in physical functioning, financial difficulties, and physical symptoms. The SI group reported more severe symptoms, including fatigue, nausea/vomiting, pain, sleep disturbances, loss of appetite, constipation, and diarrhea, likely due to their diminished physical performance. Effective management of physical symptoms, especially pain, is crucial in treating cancer patients to enhance their QOL and reduce suicide incidence. Financial difficulties were also more pronounced among individuals with SI. Improving the QOL of cancer patients through financial support, community psychological assistance, and mental health expert support can serve as a protective factor against SI.

Multivariate analysis showed that having SI was associated with an increase in role functioning scores. This does not imply that SI improves role functioning but rather reflects the patients' cognitive awareness of their ability to perform daily activities [8]. Factors such as independence, social interaction, emotional well-being, and psychological comfort are significant for QOL among lung cancer patients [29]. Patients may feel like a burden to their families, leading to SI, especially in cultures like Vietnam where family members often make decisions for the patient, particularly men. Maintaining patient autonomy and fulfilling role obligations is essential. Future research should examine the influence of cultural factors on role functioning changes in lung cancer patients to identify strategies to enhance their societal roles.

The study highlights significant implications for improving the quality of life (QOL) in lung cancer patients by addressing key areas such as social functioning, managing suicidal ideation (SI), and alleviating financial difficulties. The findings reveal that while lung cancer patients generally maintain a high level of functional QOL, they experience the lowest scores in social functioning, pointing to the need for enhanced social support services and community engagement programs. Financial support mechanisms are crucial to mitigate the economic burdens of cancer treatment, which are more pronounced in patients with SI. Integrating mental health assessments into routine oncology care is essential to identify and manage SI, potentially reducing suicide incidence and improving emotional and cognitive functioning. Effective management of physical symptoms, particularly pain

Table 1. Demographic and Clinical Characteristics of Patients

Characteristics		Freq. (n)	Percent (%)
Gender	Male	196	76.6
	Female	60	23.4
Age	< 40	11	4.3
	40–49	21	8.2
	50–59	65	25.4
	60–69	100	39
	70–79	57	22.3
	≥ 80	2	0.8
Living location	Urban	145	56.6
	Rural	111	43.4
Education	Elementary school	7	2.7
	Secondary school	67	26.2
	High school	157	61.3
	College/University	25	9.8
Occupation	Farmer	82	32
	Worker	13	5.1
	Officials	25	9.8
	Retire	57	22.3
	Other	79	30.8
Histopathological classification	Small cell lung cancer	17	6.6
	Non-small cell lung cancer	239	93.4
Clinical stage classification	Early stage	44	17.2
	Late stage	212	82.8
Time since diagnosis (months)	< 1	58	22.7
	1–3	38	14.8
	4–6	40	15.6
	7–12	54	21.1
	> 12	66	25.8
Treatments	Surgery	1	0.4
	Chemotherapy/radiotherapy	206	80.4
	Combined surgery & chemotherapy-radiotherapy	23	9
	Other (No treatment/use of traditional medicine)	26	10.2
Pain level	No pain	46	18
	Mild pain	152	59.3
	Moderate pain	45	17.6
	Severe pain	13	5.1
Mental health	Anxiety	40	15
	Depression	52	20.3
Suicidal ideation	None	235	91.8
	Wish to be dead	9	3.5
	Non-specific active suicidal thoughts	4	1.6
	Suicidal intention with method, without plan or intent	5	2
	Suicidal intention with intent, without plan	3	1.2

and fatigue, is vital for enhancing QOL. Comprehensive symptom management plans should address not only physical discomfort but also other distressing symptoms such as nausea and insomnia. Providing adequate psychosocial support to manage cancer-related fatigue, a prevalent and often unmet need, is also crucial. The

cultural context in Vietnam, where family members often make decisions for patients, particularly men, underscores the need for culturally sensitive approaches that respect patient autonomy and role functioning. Future research should explore the influence of cultural factors on role functioning and develop strategies to support patients in

Table 2. Quality of Life between Patients with and without Suicidal Thoughts

Quality of life domains	Having suicidal intention Mean $\pm$ SD	Not having suicidal intention Mean $\pm$ SD	Total Mean $\pm$ SD	p-value
Global health status	44.84 $\pm$ 16.13	59.50 $\pm$ 15.24	58.3 $\pm$ 15.8	< 0.001
Functional scales				
Physical functioning	82.22 $\pm$ 11.42	90.58 $\pm$ 11.90	89.9 $\pm$ 12.06	0.002
Role functioning	79.37 $\pm$ 14.82	82.41 $\pm$ 15.72	82.16 $\pm$ 15.65	0.394
Emotional functioning	78.17 $\pm$ 18.54	82.55 $\pm$ 15.18	82.19 $\pm$ 15.48	0.215
Cognitive functioning	79.37 $\pm$ 18.19	84.61 $\pm$ 16.11	84.18 $\pm$ 16.32	0.159
Social functioning	53.97 $\pm$ 22.30	61.13 $\pm$ 16.02	60.55 $\pm$ 16.68	0.164
Symptom scales				
Fatigue	39.68 $\pm$ 19.74	22.55 $\pm$ 16.99	23.96 $\pm$ 17.82	< 0.001
Nausea and vomiting	30.16 $\pm$ 25.61	17.66 $\pm$ 18.66	18.68 $\pm$ 19.56	0.04
Pain	35.71 $\pm$ 19.92	23.33 $\pm$ 19.38	24.35 $\pm$ 19.68	0.006
Dyspnea	26.98 $\pm$ 30.95	16.74 $\pm$ 21.65	17.58 $\pm$ 22.66	0.152
Insomnia	33.33 $\pm$ 21.08	18.01 $\pm$ 23.10	19.27 $\pm$ 23.29	0.004
Appetite loss	36.51 $\pm$ 31.46	17.87 $\pm$ 22.48	19.4 $\pm$ 23.83	0.001
Constipation	31.75 $\pm$ 28.82	18.58 $\pm$ 22.43	19.66 $\pm$ 23.24	0.013
Diarrhea	39.68 $\pm$ 24.99	20.00 $\pm$ 23.10	21.61 $\pm$ 23.83	< 0.001
Financial difficulties	58.73 $\pm$ 27.70	47.23 $\pm$ 21.48	48.18 $\pm$ 22.21	0.023

maintaining their societal roles and autonomy. Overall, these implications emphasize the need for a holistic approach to lung cancer care that integrates physical, mental, and social support to improve QOL and reduce the risk of SI among patients.

One limitation of this study is the sampling methodology, which adhered to ethical principles by requiring voluntary participation. This may have led to

a bias towards higher-performing individuals, as those in advanced illness stages are less likely to complete questionnaires and face more challenging management due to rigorous treatments. Additionally, the sample size was limited. The cross-sectional design also hindered the ability to draw causal conclusions between SI and QOL in this population. design, which hindered the ability to draw causal conclusions between SI and QOL in this population.

Table 3. Associations between Suicidal Ideation and Quality of Life in Patients with Lung Cancer

Quality of life domains	Univariate analysis			Multivariate analysis¶		
	Coef.	95%CI		Coef.	95%CI	
Global health status	-14.68*	-21.55	-7.82	-6.4	-13.26	0.46
Functional scales						
Physical functioning	-10.47*	-17.06	-3.88	0.85	-5.25	6.94
Role functioning	-4.06	-13.27	5.15	9.41*	0.38	18.45
Emotional functioning	-4.57	-12.94	3.81	3.46	-4.51	11.42
Cognitive functioning	-7.64	-18.97	3.69	5.59	-5.66	16.84
Social functioning	-7.66	-15.45	0.13	1.02	-6.66	8.69
Symptom scales						
Fatigue	18.75*	9.94	27.57	3.75	-4.56	12.05
Nausea and vomiting	15.69*	2.42	28.95	0.93	-12.74	14.6
Pain	14.37*	3.85	24.89	-6.23	-15.45	2.99
Dyspnea	18.29*	-4.25	40.82	-4.25	-27.94	19.44
Insomnia	30.67	10.15	51.18	6.79	-14.01	27.59
Appetite loss	33.37*	11.84	54.89	13.67	-7.75	35.1
Constipation	23.49*	2.95	44.04	10.47	-11.15	32.09
Diarrhea	31.40*	12.43	50.38	22.33*	2.05	42.6
Financial difficulties	13.07*	2.1	24.04	4.27	-6.98	15.52

\*  $p < 0.05$ ; ¶, The model was adjusted to age, gender, occupation, education, living location, histopathological classification, clinical stage classification, time since diagnosis (months), types of treatment, pain, anxiety and depression



In conclusion, this study indicated moderate QOL and perceived the lowest social functioning in lung cancer patients. SI was associated with role functioning scores and diarrhea scores. SI should be monitored and controlled regularly in this population during treatment to improve their QOL

### Author Contribution Statement

Conceptualization, data curation, investigation, methodology and formal analysis; NVT, LTTH, PQH, LCT, BVS. Project administration: NHY, TTTH, NTL. Supervision: NVT, LTTH, DTT, NHT. Writing-original draft and writing-review & editing; NVT, LTTH, PQH, LCT, BVS, NHY, TTTH, NTL, NVT, LTTH, DTT, NHT.

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#### Approval

The study protocol received approval from the Institutional Review Board at Hanoi Medical University (Code: 208/QD-DHYHN).

#### Ethical Declaration

The study protocol received approval from the Institutional Review Board at Hanoi Medical University (Code: 208/QD-DHYHN).

#### Data Availability

Data are available upon request (contact corresponding author).

#### Conflict of Interest

None.

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