

## Some Factors Related to Depression in Non-Small Cell Lung Cancer Patients Treated at K Hospital during 2021-2022

Le Khanh Linh<sup>1\*</sup>, Do Tuyet Mai<sup>2</sup>, Tran Thi Thanh Huong<sup>3</sup>, Pham Tuong van<sup>3</sup>

<sup>1</sup>Department of Preventive Medicine, Hanoi Medical University, Hanoi, Vietnam; <sup>2</sup>Department of Medicine, National Cancer Hospital, Hanoi, Vietnam; <sup>3</sup>Department of Medical Ethics and Psychology, Hanoi Medical University, Hanoi, Vietnam

### ABSTRACT

**Background:** Understanding lung cancer is currently the second most common cancer when assessing common cancer and the number of cancer deaths; there are a limited number of studies about depression in lung cancer patients in Vietnam.

**Objective:** This study aimed to describe depression in non-small cell lung cancer patients treated at K Hospital from 2021-2022 and associated factors.

**Materials and methods:** The study is a Cross-sectional descriptive study. The study was conducted on 243 NSCLC patients treated at K Tan Trieu Hospital by direct phone call interview and psychiatric clinical examination. We applied the PHQ-9 scale and DSM-5 for screening and confirmed depression, and the SF-12 scale was applied for quality of life measurement.

**Results:** The study found that the risk factors related to depression included stage IV disease increasing the risk of depression more than 6 times in lung cancer patients (OR=6.47;  $p < 0.05$ ) and patients with poor QoL in the depression group, in which quality of life of mental health ( $36.94 \pm 5.43$ ) and physical health ( $41.78 \pm 7.17$ ) were all lower than those in the group without depression.

**Conclusion:** Measures to monitor mental health, screen for early detection and treatment interventions, and improve quality of life are the top priorities to reduce the risk of depression in patients with non-small cell lung cancer.

**Keywords:** Depression; Associated factors; Non-small cell lung cancer

**Abbreviations:** AOR: Adjusted Odds Ratio; COR: Crude Odds Ratio; DSM-5: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; NSCLC: Non-Small Cell Lung Cancer; OR: Odd Ratio; PHQ-9: Patient Health Questionnaire-9 items; QoL: Quality of Life; SF-12: 12 Item Short Form Survey; VCART: Vietnam Grants for Cancer Research and Technology

## INTRODUCTION

The incidence and mortality from cancer is accelerating worldwide. According to the GLOBOCAN 2020 report, Vietnam ranks 91/185 in terms of new incidence and 50/185 in terms of mortality rate per 100,000 people. In addition, lung cancer is currently the 2<sup>nd</sup> most common cancer worldwide when assessing common cancers and the number of cancer deaths [1].

Cancer has a long and complicated therapeutic process with high treatment costs. Moreover, when it reaches advanced stages, the patient suffers not only physical pain but also a hefty psychological impact. The most common psychological traumas among cancer patients include stress, anxiety, and depression [2]. Patients who did not undergo surgery or receive radiation therapy, were younger, or had terminal cancer were more likely to develop depression [3]. Depression also affects the effectiveness of treatment and the patient's quality of life [4].

**Correspondence to:** Le Khanh Linh, Department of Preventive Medicine, Hanoi Medical University, Hanoi, Vietnam, E-mail: lekhanhlinhhmu@gmail.com

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To provide data for health authorities in assessing the status and early identification signs of depression in cancer patients. From there, timely intervention and treatment measures should be developed. This has important implications for patients during lung cancer treatment.

To contribute to improving the quality of medical services and quality of life for patients, we carried out the study "Some factors related to depression in non-small cell lung cancer patients treated at K hospital during 2021-2022".

## MATERIALS AND METHODS

### Study design and setting

The study was conducted on NSCLC patients being treated at K Hospital in 2021-2022 by a cross-sectional descriptive study. The study period was from 09/2021 to 09/2022 at K Hospital, Tan Trieu Campus, and Hanoi.

**Recruitment:** To enroll as many participants as possible, the inclusion criteria were age from 18 to 65 years who had confirmed non-small cell lung cancer diagnosis by pathology and did not have a medical history of communication problems.

### Data collection and variables

The sample size selected for the study is calculated according to the formula for estimating the sample size for a proportion in the population:

In fact, 243 people were recruited to participate in the study.

### Objective variables

Relevant factors were determined by the relationship between depression and the factors below according to the DSM-5:

**Personal factors:** Age, Gender, Living, Marital status.

**Social factors:** Education level, Job, Health insurance.

**Cancer factors:** Disease stages, Time of diagnosis, Treatment methods

**Data management and analysis:** Information was collected directly on the questionnaires of study subjects that had been built with a set of questions. Data were entered and monitored by Excel and processed using SPSS version 20.0 software. Data entry SPSS statistical analysis of mean, median and standard deviation. The study used  $p < 0.05$ , 95% confidence interval.

### Ethical considerations

The study was explained, and participants volunteered. Patients had the right to withdraw from the study at any time. Be sure to keep the information that the patient provided confidential, except where it involved harming yourself or others. Patients with severe depression at risk of suicide or behavioral disorders would be referred to a psychiatrist for treatment. The study explains depression group of psychology is unrelated to cancer treatment. All patient and treatment data were confidential and just used for research. Science Council approved VCART research, Cancer Research Institute, K Hospital. Council Decision No. 528/Decision-Preventive Medicine and Public Health, 29/12/2022, School of Preventive Medicine and Public Health, approved the baseline topic.

## RESULTS

Table 1 shows that there were 17 study participants in the depression group; those under 60 years old accounted for 65.4% of the cases, while those over 60 years old accounted for 34.6% of the cases.

Characteristics	No depression		Depression		COR (95%CI)
	n	%	n	%	
<b>Gender</b>					
Male	149	68.7	15	57.7	1.6 (0.7-3.7)**
Female	68	31.3	11	42.3	-
<b>Age (years)</b>					
<60	139	64.1	17	65.4	0.94 (0.40-2.22)**
≥ 60	78	35.9	9	34.6	-
<b>Education levels</b>					
<High school	182	83.9	22	84.6	0.95 (0.31-2.91)**
≥ High school	35	16.1	4	15.4	-
<b>Marital status</b>					
Single	1	0.5	0	0	-
Married	214	98.6	26	10.7	-
Separation/Divorce	2	0.9	0	0	-
Widow	0	0	0	0	-

Health insurance					
Yes	214	98.6	26	100	-
No	3	1.4	0	0	-
Total (n=243)	217	100	26	100	-

Note: \*: p<0.05; \*\*: p<0.10; COR: Crude Odds Ratio; The p-values is based on t-test.

**Table 1:** The relationship between demographic data and depression in DSM-5.

In a total of 26 patients with depression, 84.6% had a low school diploma, while 15.4% had a high school diploma or higher. All patients with depression confirmed by the DSM-5 were married, accounting for 10.7%. There was no relationship between gender, age, education levels, marital status, health insurance and depression (p>0.05).

Table 2 shows that stage IV increased the risk of depression in the DSM-5 by more than 6 times in lung cancer patients (OR=6.47; p<0.05). The majority of participants had stage IV disease, with depression accounting for 84.6%. The difference between depression in the DSM-5 and disease stages was statistically significant, and no relevant factors were found in treatments and depression in the DSM-5.

Table 3 shows that there were large differences in the quality of life aspects of the depression group compared with the no depression group. Patients with poor QoL quality in the depression group, in which quality of life of mental health (36.94 ± 5.43) and physical health (41.78 ± 7.17) were all lower than the group without depression.

Table 4 presents the factors associated with depression in NSCLC patients according to the DSM-5 through the QoL characteristics analyzed. Patients with low-quality mental health had a higher risk of developing depression than the other group. Our study found that the difference was statistically significant in most groups (p<0.05).

	No depression		Depression		AOR (95%CI)
	n	%	n	%	
<b>Disease stages</b>					
I - III	118	54.4	4	15.4	6.47 (2.14-19.62)*
IV	99	45.6	22	84.6	-
<b>Treatments</b>					
Surgery	19	8.8	2	7.7	0.56 (0.06-4.82)**
Radiotherapy	45	20.7	3	11.5	0.66 (0.25-1.77)**
Chemotherapy	53	24.4	10	38.5	1.05 (0.60-1.85)**
Target treatment	86	39.6	9	34.6	0.92 (0.6-1.41)**
Total (n=243)	217	100	26	100	-

Note: \*:p<0.05; \*\*: p<0.10; AOR: Adjusted Odds Ratio; The p-values is based on t-test.

**Table 2:** Factors associated with disease and DSM-5.

Variable	No depression	Depression	Total (n=243)
Physical activity	51.64 ± 8.38	39.95 ± 12.84	50.39 ± 9.63
Role disorder due to physical health problem	28.18 ± 3.15	23.16 ± 4.14	27.64 ± 3.61
Feeling body pain	53.59 ± 6.39	42.16 ± 11.97	52.37 ± 7.99
General health	37.81 ± 8.95	29.07 ± 8.28	36.88 ± 9.27
Vitality	36.97 ± 11.44	33.07 ± 10.27	36.57 ± 11.36

Social activities	54.47 ± 6.13	48.02 ± 11.31	53.78 ± 7.13
Limited role due to emotional problems	21.68 ± 2.47	15.86 ± 5.48	21.06 ± 3.61
Mental health	51.4 ± 6.12	38.72 ± 7.63	49.39 ± 7.87
Life quality of physical health	43.11 ± 5.94	34.51 ± 9.02	41.78 ± 7.17
Life quality of mental health	38.2 ± 4.42	30.06 ± 5.41	36.94 ± 5.43

**Table 3:** The relationship between QoL (SF-12) characteristics and depression of the patients in the DSM-5.

Variable	COR (95%CI)
Physical activity	0.91 (0.88-0.94)*
Role disorder due to physical health problem	0.74 (0.67-0.82)*
Feeling body pain	0.87 (0.83-0.92)*
General health	0.86 (0.80-0.93)*
Vitality	0.96 (0.92-1.01)**
Social activities	0.92 (0.89-0.96)*
Limited role due to emotional problems	0.75 (0.69-0.82)*
Mental health	0.75 (0.66-0.86)*
Life quality of physical health	0.85 (0.78-0.92)*
Life quality of mental health	0.65 (0.53-0.80)*
QoL: Quality of life	-

**Note:** \*: p<0.05; \*\*: p<0.10; COR: Crude Odds Ratio; The p-values are based on t-tests

**Table 4:** The difference between QoL (SF-12) characteristics and depression of the patient in DSM-5.

## DISCUSSION

Individuals over 50 years of age and singles were more likely to develop depression [5]. This study had a lower rate of depression in lung cancer patients than Yu Lee and Pao-Yen Lin's study of 104 patients at Chang Gung Hospital in Taiwan (25%). The Yu Lee and Pao-Yen Lin study included small-cell lung cancer patients who have a worse prognosis and disease mechanism. Inflammatory cytokines increase depression risk [6]. The above factors were also demonstrated in the study of Shahedah, et al. [7] who showed that those who were married or had a partner had an average depression score of 9.42 lower than those who were single/widowed/never married/divorced.

Otherwise, our study found 26 depressed non-small cell lung cancer patients with associated factors. A total of 65.4% of individuals under 60 years of age had depression. This supported a Taiwanese study by Yu Lee and Pao-Yen Lin that found that

depression was more common in young lung cancer patients [6]. The rate of depression in NSCLC patients was much higher in men than in women, which could be explained by the number of lung cancer cases predominating in men, which was consistent with many other studies [8,9]. Otherwise, young cancer patients with little life stability may be more emotionally affected than middle-aged and elderly patients [10]. Educational level was below high school (84.6%). Due to their limited awareness and coping skills, less educated cancer patients may have more psychological issues. The study also found no statistically significant correlation between gender, age, and education and patient depression rates.

In our study, stage IV lung cancer patients had a 6.47 fold higher risk of depression (OR=6.47; p<0.05). Late-informed patients often have more psychological stress, more severe physical symptoms, and a greater impact on life due to illness, increasing their risk of depression. Depression may reduce cancer treatment

adherence [11]. This suggested that advanced-stage NSCLC patients, whether cause or effect, may contribute to depression and low QoL. Hence, clinicians should pay attention to early screening and support mental health care of patients with non-small cell lung cancer.

The analysis showed that depressed patients had a much lower quality of life than nondepressed patients. Through the analysis, patients with depression had poor QoL in physical, emotional, and general health, especially mental health ( $36.94 \pm 5.43$ ), compared to the group without depression ( $41.78 \pm 7.17$ ), which was statistically significant in most groups. Yu Lee and Pao-Yen Lin found a similar decrease in quality of life in lung cancer patients with depression compared to those without depression [6]. This result was consistent with the fact that in the study of Prapa, et al. [12] and Ostroff, et al. [13] the disease and therapy-related adverse effects might lead to poor Quality Of Life (QoL) and increased psychological distress. Depression was independently associated with poor prognosis, treatment adherence, and QoL [14,15]. These findings support the clinical approach and improve QoL in Non-Small Cell Lung Cancer (NSCLC) patients.

## CONCLUSION

No relevant factors were found in the characteristics of gender, age, living, education level, marital status and health insurance. The difference between depression in the DSM-5 and disease stages was statistically significant at  $p < 0.05$ , and patients with stage IV disease had a more than 6-fold increased risk of depression in the DSM-5 in lung cancer patients ( $OR = 6.47$ ;  $p < 0.05$ ). The difference was statistically significant in most groups for quality of life characteristics ( $p < 0.05$ ). In particular, patients with low quality of mental health had a higher risk of depression than the other group.

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