Original Article

Psychological Distress and Health-related Quality of Life in Lung Cancer Patients

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Background : The symptom burden of lung cancer is higher than that of other malignancies, but less is known about the incidence of psychological distress and how it can be connected to the physical symptom load in lung cancer patients. We evaluated the impact of physical illness on psychological distress among stable patients with lung cancer.

Materials and Methods : The respiratory medicine department of a tertiary health care centre recruited 90 patients with stages I to IV lung cancer for a study. The study used the DASS-21 scoring tool to evaluate psychological distress. Regression analyses were conducted to determine the relationship between distress and symptoms, type of cancer and Tumor, Node and Metastasis staging.

Results : Out of all the patients enrolled, 26.67% had moderate depression according to the DASS-21 scale. On the Likert scale, 55.56% of participants reported moderate anxiety and 9% had clinically significant severe anxiety. Mild depression was present in 34.44% of patients and moderate depression in 26.67%. Only 12% of enrolled participants showed signs of stress. Our analysis indicated that males were more likely to report symptoms of depression, anxiety and stress. Age also affected depression, anxiety and stress noted in our study participants. In addition, smoking, cancer stage and clinical symptoms showed significant associations with all DASS-21 subscales.

Conclusion : This study showed that patients with lung cancer had a high proportion of depression and anxiety. It has been suggested that the psychological well-being of lung cancer patients should be given greater consideration to improve their overall management.

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Lung cancer is the most common cancer and the leading cause of cancer-related deaths Worldwide. As per the latest report of GLOBOCAN, 1.83 million people have lung cancer, accounting for 12.9% of all cancers Worldwide[1]. It is a lethal disease characterized by uncontrolled malignant proliferation of the epithelial cell lining of the lower respiratory tract. In India, lung cancer accounts for 5.9% of all cancers[2].

Being diagnosed with cancer and undergoing anti-cancer treatment can result in physical symptoms such as exhaustion, shortness of breath and various psychological issues. These issues may persist throughout the cancer journey. They can affect

> **Editor's Comment :**
> - Lung cancer patients may suffer from depression and anxiety. In this study, more than half experienced moderate anxiety, and more than a quarter had moderate depression.
> - The primary factors related to psychological distress in patients with lung cancer are age, smoking history, cancer stage, and the presence of physical symptoms.
> - The management of lung cancer should prioritize psychological distress due to its high prevalence and detrimental effects. Early identification and intervention in moderate and severe cases can improve patients' overall well-being and potentially improve treatment outcomes.

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anywhere from 20% to 58% of patients. Three studies have shown that lung cancer patients experience the highest levels of psychological distress, ranging from 17.0% to 73.0%[4]. As per the definition given out by the National Comprehensive Cancer Network (NCCN) guidelines, distress refers to a multifactorial and unpleasant emotional experience involving psychological, social, spiritual and physical changes. Clinically significant psychological distress is linked to a number of adverse outcomes, including discontinuing anti-cancer therapy, prolonged hospital stay, higher suicidal risk, poor Quality of Life and higher

risk of mortality. Moreover, a previous study also evidenced that psychological distress can accelerate the growth of tumour cells. Emphasizing the significance of diagnosing and treating emotional distress and mood disorders, healthcare professionals Worldwide recognize the sixth vital sign when treating cancer patients.

To improve clinical care and nursing in the future, the present study was proposed to evaluate the impact of physical illness on psychological distress among stable patients with lung cancer.

MATERIALS AND METHODS

Study Design and Setting :

A cross-sectional questionnaire-based study was conducted in Kasturba Chest Hospital, Department of Respiratory Medicine, King George's Medical University, Lucknow, UP. This study was approved by the Institutional Ethics Committee (Ref. Code: XIII PGTSC-IIA/P4). A written informed consent was obtained from all the participants prior to enrolment. Data was compiled in pre-formed study-questionnaire.

All the patients coming to OPD and IPD who were histopathologically diagnosed with lung cancer of age greater than 18 years were enrolled in the study from February, 2021 to January, 2022. Exclusion criteria were patients who didn't give consent, patients with pulmonary metastasis of extra-pulmonary malignancy and sputum positive for pulmonary tuberculosis.

Measures :

The DASS-21 questionnaire was chosen to measure depression, anxiety, and stress simultaneously and does not take into account cultural background and we chose the validated short version to save time. The domain of depression evaluates low self-esteem, low positivity and hopelessness. The anxiety domain assesses subjective feelings of fear, physiological hyperarousal and autonomic arousal and the stress domain considers negativity, agitation and tension. This is in accordance with the tripartite theory, which suggests that anhedonia (loss of pleasure), or lack of positivity, is an integral factor differentiating depression from anxiety. This instrument aims to assess and discriminate symptoms of anxiety and depression, based on the Tripartite Model, which groups the symptoms of anxiety and depression into three factors[5] : (a) the presence of negative affect (depressed mood, insomnia, irritability), (b) specific factors of depression (anhedonia, absence of positive affect) (c) specific symptoms of anxiety (somatic tension and hyperactivity).

Consisting of 21 items, each factor groups seven items answered using a four-point Likert-type scale, indicating the severity and frequency of symptoms experienced in the previous seven days. Responses were measured on a Likert scale ranging from 0 to 3:

- did not apply to me at all.
- applied to me to some degree, or some of the time.
- applied to me to a considerable degree or a good part of the time.
- applied to me very much or most of the time.

Interpretation of Depression, Anxiety and Stress Scale Questionnaire :

DASS-21, a shorter version of 42 item questionnaire, is a validated tool for evaluating psychological burden and assessing the psychological state in a wide range of diseases. There were 21 questions evaluating depression, anxiety and stress components in a clinical setting. As represented in Table 3, scores of 0-9, 10-13, 14-20 and 21-27 were considered normal, mild, moderate and severe, respectively. A score above 27 was considered as having an extremely severe condition of depression.

Data Analysis :

The measurement variables were presented as mean standard deviation, whereas the enumeration data, such as gender, age, smoking, etc, were expressed by frequency (cases). To look at the respondents' demographics and other chosen variables, an analysis of descriptive statistics was done. To compare the variations among subgroups, the T-test, One-way Analysis of Variance (ANOVA), and Kruskal-Wallis test were employed. By modifying the important variables in a univariate analysis at $P \leq 0.10$, multiple linear regression was utilised to investigate the psychological impact and probable contributors. The significance threshold was established at $P < 0.05$.

RESULTS

Patient Characteristics :

In 90 patients, who consented to complete the DASS-21 questionnaire, were enrolled in the study. Patient demographics and baseline characteristics are shown in Table 1. The patients enrolled in the study ranged from 38 to 76 years. The mean age of subjects was 54.14 ± 9.4 years. The majority of patients were male (80%), with only 20% females. 37.78% of the patients were educated at the primary level, 18.89% at the secondary level and 28.89% at the tertiary level, respectively, 14.44% were uneducated. Of the 90

Table 1 — Socio-demographic characteristics of patients (n=90)			
Characteristics		Value	%
Age ± SD (in years)		54.14 ± 9.4	
Gender	Male	72	80
	Female	18	20
Education	Illiterate	13	14.44
	Primary School Certificate	34	37.78
	Middle School Certificate	17	18.89
	>High School Certificate	26	28.89
Occupation	Unemployed	34	37.78
	Employed	56	62.22
Residence	Rural	39	43.33
	Urban	51	56.67
Economic Status	LIG	30	33.33
	MIG	60	66.67
Smoking	Smokers	12	13.33
	Non-smokers	31	34.44
	Ex-smokers	47	52.22
Duration of smoking	0-5 years	18	20.00
	5-10 years	17	18.89
	>10 years	24	26.67

participants, most respondents (62.22%) were employed and 37.7 were unemployed.

Likewise, 56.67% were living in urban areas, while 43.33% were rural residents. 13.33% of the patients were current smokers and 52.22% were ex-smokers. 34.44% of the participants were non-smokers too. The average time since first lung cancer diagnosis in this patient cohort was 232 days (Table 1).

The duration of smoking among smokers and ex-smokers ranged from 0 to 15 years. Most of the participants (41%) had a smoking history of more than ten years. While 30% of the smokers had a history of 0-5 years, followed by 29% with 5-10 years of duration of smoking, respectively.

The clinical presentation of patients is shown in Table 2. The most common clinical finding observed was hemoptysis (65.56%), followed by breathlessness (52.22%) and chest pain (46.67%). The less common clinical finding among lung cancer patients in our study was cough which was presented by 42.22% of the participants.

In 86.67% of the participants had NSCLC, while SCLC (13.33%) was less prevalent among our study group. In 71.11% (n = 64) of the study participants

Table 2 — Clinical characteristics of patients (n=90)			
Symptoms		No	%
Cough		38	42.22
Chest pain		42	46.67
Breathlessness		47	52.22
Hemoptysis		59	65.56
Respiratory distress		54	60.00
Types of Cancer	NSCLC	78	86.67
	SCLC	12	13.33
Stage	Early (I/II)	13	14.44
	Advanced (III/IV)	64	71.11

were in Stage III/IV at the time of questionnaire administration. The remaining 13% of the stage II patients were diagnosed at earlier stages and had progressed to Stage III.

Prevalence of Psychological Distress in Study Participants :

Fig 1 represents the frequency distribution of different scores of DASS-21 parameters. Depression scale scores ranged from 2 to 18, while anxiety scale scores ranged from 3 to 16 and stress scores from 3 to 17, respectively, for all the lung cancer patients enrolled in the study. As regards the psychological distress of our sample, we observed that the mean score for depression was 10.73 ± 3.5, for anxiety was 10.64 ± 3.02 and for stress was 10.71 ± 3.16. Most patients had mild depression (average 10.73) and moderate anxiety (average 10.64).

Table 3 is a representation of the distribution of patients in psychological distress categories. Anxiety was very common among all the lung cancer patients enrolled in our study. 34.44% of the patients had mild depression, while 26.67% had moderate depression. 55.56% of patients were having a moderate level of anxiety at the time of enrolment and 10% were suffering from severe anxiety. Stress was observed in only 12% of all the enrolled participants.

Regression Analysis :

For regression analysis, all socio-demographic variables from Table 1 were included, except educational background, residential area and family income, as these variables had a high percentage of missing data. Results of univariate and multivariate regression analysis for depression are presented in
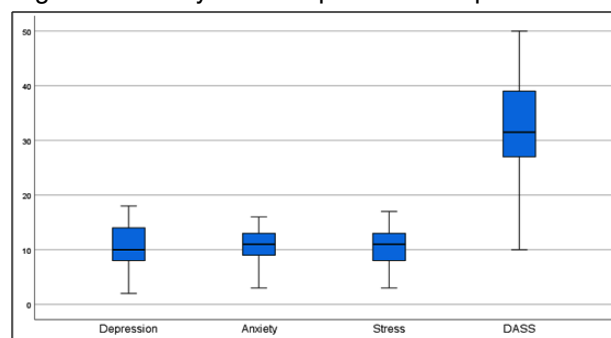

Fig 1 — Prevalence of psychological distress in study participants

Table 3 — Patients Distribution on Psychological Distress Categories				
	Normal	Mild	Moderate	Severe
Depression	35(38.89%)	31(34.44%)	24(26.67%)	0
Anxiety	14(15.56%)	17(18.89%)	50(55.56%)	9(10%)
Stress	79(87.78%)	11(12%)	0	0

Table 4. The multivariate analysis indicated that Males were more likely to report symptoms of depression, anxiety and stress (95% CI: 2.09-13.08; 95% CI: 1.23–6.89; 1.19-3.92 respectively), Similarly, age-associated depression, anxiety and stress were also noted in our study participants (95% CI: 0.08-0.88; 95% CI: 0.05-0.16; 95% CI:0.06-0.19). Furthermore, smoking, stage of cancer and clinical symptoms were also significantly associated with all DASS-21 subscales.

Table 4 — *Multiple linear regression analysis of influence factors of anxiety,depression and stress symptoms*						
Variable		Depression		Anxiety		Stress
		B (95% CI)	P	B (95% CI)	P	B (95% CI)	p
Gender	Male (ref)	-	-	-			
	Female	2.09-13.08	<0.001	1.23-6.89	0.018	1.19-3.92	0.011
Age		0.08-0.88	0.006	0.05-0.16	<0.001	0.06-0.19	<0.001
Pathological Type :							
Adenocarcinoma		0.68-3.76	0.277	0.41-0.31	0.784	0.63-0.230	0.357
Squamous cell carcinomas		0.97-1.04	0.72	0.17-0.216	0.824	-0.151~0.311	0.737
Small cell lung cancer		0.65-3.82	0.32	0.97-1.02	0.882	0.47-1.82	0.808
Smoking		1.19-3.92	0.011	-1.740-1.094	0.052	0.052	0.320
Symptoms	Cough	1.03-1.08	<0.001	1.40-9.58	0.008	1.40-9.58	0.008
	Chest pain	1.23-5.27	0.012	-1.740-1.094	<0.001	2.53-14.17	<0.001
Breathlessness		1.8-10.7	<0.001	1.10-3.66	0.023	1.01-3.44	0.047
TNM staging	II	-0.27-0.07	0.562	0.06-0.85	0.021	1.03-3.98	0.041
	III / IV	0.21-0.66	0.001	0.21-0.89	0.004	1.02-1.07	0.001

DISCUSSION

Lung cancer is a major public health problem in both developed and developing countries. The diagnosis of cancer or its treatment may have a negative impact on essential areas of a patient's well-being in lung cancer. Therefore, one of the main goals of palliative care is to alleviate uncomfortable symptoms across a variety of domains. However, reports of palliative clinical trials in the field of cancer are frequently restricted to the effect of treatment on survival, toxicity, or physical symptoms rather than psychological effects[6].

In the present study, we explored the level of psychological distress with histologically proven lung cancer patients and further explored the related factors of depression and anxiety. The patients with lung cancer coming to OPD and IPDs of Department of Respiratory Medicine in the year 2021-2022 were recruited. In our study, the mean age of the participants was 54.14 ± 9.4. In our study,the majority of patients (80%) were males, followed by females, who were 20%. This is in accordance with the American Cancer Society, 2016[7].

The majority of the patients were Ex-smokers (52.22%), 13.33% were smokers and 34.44% of patients were non-smokers. This is in contrast to the study by Rittberg, *et al* 2020[8]. In our study; we found that hemoptysis was very common in nearly 65.56%, followed by respiratory distress (60%). This is in accordance with the work done by Zhang, *et al* 2019[9]. Regarding the clinical presentation of the patients, 86.67% suffered from NSCLC and 13.33% from SCLC, which is again in line with the previous study conducted by Prapa, *et al* 2021[10]. It has been shown that psychological distress is linked to a number of poor clinical outcomes, including the discontinuation of cancer therapy, low Quality of Life and increased morbidity and death[11]. It is imperative to clarify the potential mechanisms of the development and progress of psychological distress among patients with lung cancer to develop a more effective intervention protocol.

The characteristics of the patients related to depression and anxiety were investigated. It was found that 26.67% of the total enrolled patients had moderated depression as per the DASS-21 scale. Our results were inconsistent with previous findings by Tian, *et al* 2021[12]. Although some studies reported a higher detection rate[13-14]. The proportion of anxiety in the patients with lung cancer in our study was relatively high, ie, 55.56% of the participants had moderate anxiety on a Likert scale, followed by 9% suffering from severe anxiety. Compared with the previous investigations, the proportion of anxiety reported in our study was higher[15]. This might be related to the fact that patients treated in tertiary hospitals were generally diagnosed in the past. Research showed that anxiety was the main psychological disorder that gradually increased as time passed, with further investigations[16]. This study also showed gender, age and smoking were related factors for depression and anxiety. The percentages for the prevalence of psychological distress vary among many studies. For instance, in a recent multi-centre study involving 561 patients, the prevalence of depression and anxiety was 19%[17]. In another cross-sectional study, these percentages increased to 88% for depression and 71.5% for anxiety. This variance can easily be explained by considering the differences in data collection methods, tools and settings. Additionally, several factors should be considered when interpreting data; for example, self-reported diagnosis

lacks credibility and cultural differences can cause differences in stress responses.

This study has some potential limitations that should be further interpreted. First, the sample size was relatively small; Quality of Life should also be assessed simultaneously because it could help doctors in daily practice as they closely monitor patients. Also, Quality of Life is affected by the patient's perception of illness and treatment and it is altered by factors such as harm, stress, perceptions and social opportunities.

CONCLUSION

Our data shows that the patients with lung cancer had a high proportion of depression and anxiety. Conclusions indicated that the psychological disorders of lung cancer should be paid more attention to for better management of the patients. In fact, in patients with mild symptoms of distress, psychological therapy and those with moderate to severe distress should be given psychological as well as pharmacological therapy for better management and adherence to treatment in lung cancer patients.

Conflicts of Interest : None

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