Patient-Reported Quality of Life in Lung Cancer: A Structured Analysis of Physical, Psychological, and Social Dimensions

[1]Dr. Charu Sachdeva , [2]Ms Purvi Jain, [3]Dr Rashi Sachdeva
[1]Assistant medical superintendent and Joint member secretary IRB, [2]IRB Coordinator, [3]Statistician
[123]Rajiv Gandhi Cancer Institute and Research Centre, Rohini sector-05, Delhi - 110085

ABSTRACT

Background: Lung cancer remains one of the leading causes of morbidity and mortality rate in India. Despite therapeutic advancements, patients often experience debilitating symptoms along with poor quality of life (QoL). This study was conducted to assess the dynamic interaction between physical symptoms, psychological burden, and demographic variables, and to highlight areas requiring integrated, patient-centered interventions. **Methods:** A cross-sectional, hospital-based observational study was conducted at a tertiary oncology center. Patient-reported outcomes were assessed using EORTC QLQ-C30 and LC13 questionnaires. Visual data representations, including Sankey diagrams and box plots, were used to analyze symptom clusters and demographic variations in global health scores. **Results:** Fatigue emerged as the central symptom, frequently associated with moderate dyspnea and severe coughing, particularly among patients aged 40–60. Older patients reported significantly lower QoL scores. Gender differences were also observed where higher score variability in younger females and lower median scores in older males. Approximately 40% of patients reported depressive symptoms, and 16–23% experienced anxiety. Patients with better psychosocial support reported improved engagement and emotional resilience. **Conclusion:** The findings highlight the necessity for multidimensional care models addressing symptom control, psychological support, and regular QoL monitoring to improve outcomes in lung cancer patients.

KEYWORDS: Lung cancer, Quality of life, Fatigue, Psychological distress,

INTRODUCTION

Lung cancer is one of the most common and fatal cancers worldwide, with rising incidence and mortality in India, particularly among males. Only 16% of non-small cell lung cancer (NSCLC) cases are detected early, limiting curative treatment options. Advanced stages often require chemotherapy, radiotherapy, and palliative care, with a primary focus on symptom relief and improving quality of life.[1]Quality of life has become a key focus in lung cancer research, as both the disease and its treatment profoundly affect patients' physical, psychological, cognitive, and social well-being. Symptoms such as chronic cough, dyspnea, fatigue, weight loss, and pain contribute to significant functional impairments, while psychological distress including anxiety, depression, and fear of mortality further deteriorates QoL.[2]

Quality of life (QoL) in lung cancer patients is influenced by a variety of factors, including physiological, psychological, social, and treatment-based conditions. Understanding these factors highlights the importance for improving patient care and outcomes. Given the high symptom burden and treatment related challenges, depression, anxiety, and emotional distress are major contributors to reduced QoL. These psychological issues often correlate with physical symptoms and can exacerbate the overall burden of the disease.[3]Lung cancer patients in India face reduced quality of life (QoL) due to late-stage diagnosis, treatment side effects, and socio-economic challenges. Comprehensive care including financial and psychosocial support is essential for improving patient and caregiver well-being. Self-reported QoL, a key supplement to clinical evaluation, helps assess treatment efficacy and predict survival. Studies have shown that early QoL assessment provides valuable prognostic insights. Notably, India's age-standardized incidence rate of lung cancer rose from 6.62 to 7.7 per 100,000 between 1990 and 2019, with higher rates in males.[4,5,6]

Why do we need this study?

Quality of life (QoL) is not a static thing; it varies with disease progression, treatment phases, and personal circumstances such as employment status and family support. Regular assessment helps identify emerging concerns such as increased pain, emotional distress, or financial strain allowing for timely and targeted interventions. Incorporating structured QoL evaluations into routine clinical practice ensures that patients' experiences are acknowledged, supports shared decision-making, and enhances treatment adherence and overall care quality.

MATERIALS AND METHODS

Aim and Design

This study employs a cross-sectional design to assess the quality of life (QoL) in lung cancer patients using EORTC-Q30 and LC13. The cross-sectional approach enables a comprehensive snapshot analysis of patient experiences, helping to understand the impact of treatment modalities, disease progression, and emotional well-being. A total of 100 lung cancer patients were randomly recruited visiting the lexical oncology OPD from a tertiary care oncology center in Northern India, ensuring a diverse representation of disease stages and therapeutic interventions across various treatment trajectories.

Inclusion Criteria

1. Histologically confirmed diagnosis of lung cancer
2. Age ≥ 18 years
3. Currently undergoing primary lung cancer treatment (e.g., surgery, chemotherapy, radiotherapy) or having completed treatment
4. Ability to understand study procedures and provide written informed consent
5. Receiving care at the designated tertiary oncology center in Northern India

Exclusion Criteria

1. Presence of metastatic lung cancer with severe systemic complications (e.g., uncontrolled organ failure)
2. Significant cognitive impairment or psychiatric condition that precludes reliable completion of QoL questionnaires
3. Not actively receiving lung cancer treatment and not within the post-treatment follow-up period at time of recruitment
4. Any concurrent malignancy (other than non-melanoma skin cancer) requiring active treatment
5. Inability to communicate in the study language or to comply with study procedures

Procedure

Eligible patients were identified through a review of medical records at the tertiary care oncology center and approached during their routine follow-up visits. After confirming eligibility, a trained research assistant explained the study objectives and procedures in the patient's preferred language (English or Hindi) and obtained written informed consent.

Data were collected using the European Organization for Research and Treatment of Cancer's QLQ-C30 questionnaire and the disease-specific QLQ-LC13 module.[7,8] Together, these instruments assess:

- **Functional status** across five dimensions: physical, psychological, cognitive, social, and role functioning via standardized items.
- **Role functioning**, through questions on the ability to perform work-related tasks and engage in leisure activities.
- **Symptom severity** (e.g., pain, fatigue, dyspnea), and **financial burden** related to disease and treatment.
- **Global quality of life**, via two overall QoL items.

Questionnaires were self-administered in a quiet, private setting, with assistance provided as needed. Completed forms were reviewed for completeness immediately after completion, and missing responses were clarified in person. All data collection procedures adhered to the protocol approved by the Institutional Review Board, ensuring participant confidentiality, voluntary participation, and compliance with ethical standards.

RESULTS

Figure 1.

This Sankey diagram visualizes how lung cancer patients flow through key demographic and symptom-severity categories, based on combined QLQ-C30 and LC13 data. On the left, patients are stratified by age groups ("<30," "30–40," "40–50," "50–60," "60–70," and "70+"). Flows then split by gender and proceed to fatigue levels ("Low," "Moderate," and "High"), followed by dyspnea severity, and finally cough intensity ("Low," "Moderate," and "High").

- The largest cohorts are in the 40–50 and 50–60 age groups, with a slightly higher proportion of females.
- Fatigue: Most patients regardless of age or gender report moderate to high fatigue.
- Dyspnea to Cough Trajectory: Among those with high fatigue, a majority experience moderate dyspnea, which predominantly leads to high coughing levels. Conversely, patients with low fatigue largely report low dyspnea and low coughing.

This flow highlights how demographic factors correlate with escalating symptom burdens and underscores the need for targeted symptom management strategies in subgroups with high fatigue and respiratory distress.

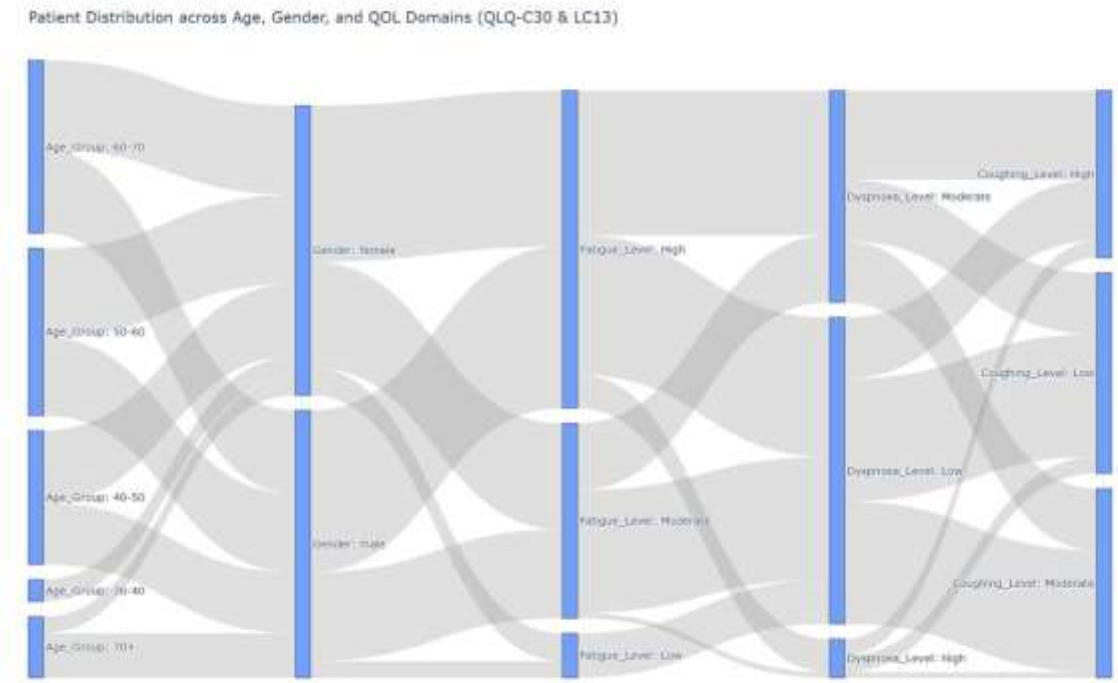


Figure 2. Global Health Status (QLQ-C30) by Age Group and Gender

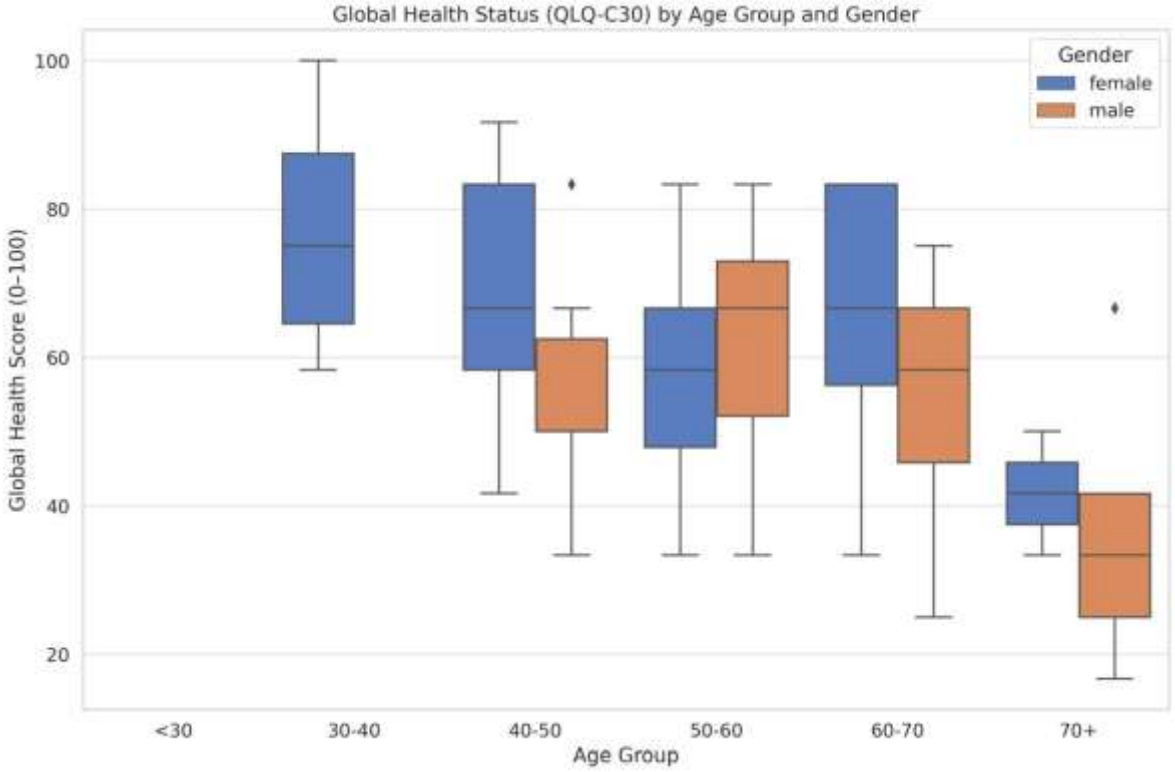
Further, results show patients' self-reported global health scores (0–100 scale) across age brackets and between genders where median global health steadily declines with advancing age in both sexes.

➔ **Gender Differences:**

- In younger groups (<30 and 30–40), females report higher median scores and a wider interquartile range, indicating greater variability in perceived health.
- In middle age (40–60), male scores slightly exceed female scores, with males showing a narrower distribution.
- In older cohorts (60–70 and 70+), both genders report low median scores, but females maintain slightly higher medians than males in the 70+ group.

➔ **Variability and Outliers:** Younger and middle-aged groups exhibit more outliers, suggesting heterogeneous health perceptions, while older groups' scores cluster tightly at lower values.

These patterns corroborate that global health perception worsens with age and can differ by gender, informing clinicians to anticipate and address age- and gender-specific concerns in lung cancer care.



DISCUSSION

This study provides important insights into the complex symptomatology and quality of life (QoL) concerns among patients with lung cancer in the Indian population. The interrelationship between multidimensional factors like physical, psychological, and demographic factors necessitates a comprehensive and individualized approach to patient care. Our findings underscore the need for integrated interventions that address not only the physical manifestations of the disease but also the psychosocial dimensions affecting patient well-being. A prominent observation from the analysis is the frequent clustering of fatigue with moderate dyspnea, often culminating in severe coughing, particularly among individuals aged 40–60. This symptom trajectory highlights fatigue as a central and burdensome complaint, consistent with prior literature identifying it as a major determinant of functional decline and reduced QoL in this population[9]. Management strategies must therefore extend beyond pharmacological options to include structured physical activity, energy conservation techniques, and other supportive therapies aimed at disrupting this cascade of symptom progression.

This study presents a comprehensive visualization of the interplay between age, gender, and symptom burden—including fatigue, dyspnoea, and coughing—among lung cancer patients, using the EORTC QLQ-C30 and LC13 instruments. The Sankey diagram offers a dynamic representation of patient transitions across QoL domains, revealing critical insights into symptom patterns and demographic distributions.The majority of the patient population fell within the 50–69 and 70+ age groups, which aligns with the global epidemiological profile of lung cancer that predominantly affects older adults. Notably, male patients constituted a significant proportion of these age groups, exhibiting a wider variability in symptom severity compared to their female counterparts. This observation is consistent with existing literature suggesting that male patients may present with a broader range of symptom experiences due to delayed health-seeking behaviour and higher smoking prevalence.

Fatigue emerged as a pivotal symptom influencing downstream QoL domains. A clear association was observed between increased fatigue and higher levels of dyspnoea and coughing. This symptom clustering underscores the multidimensional burden faced by patients and emphasizes the need for integrated symptom management strategies. The presence of moderate fatigue, in particular, appeared to serve as a transitional point toward more severe manifestations of dyspnoea and coughing, suggesting its potential as a prognostic indicator.

Interestingly, female patients, though fewer in number, predominantly exhibited moderate fatigue and dyspnoea. This aligns with previous research indicating gender-specific differences in symptom perception and reporting, potentially influenced by psychosocial and biological factors (Giese-Davis et al., 2011). These findings highlight the necessity of gender-sensitive approaches in supportive care interventions.

The observed symptom trajectories support the utility of routine QoL assessments in clinical practice, not merely as outcome measures but as active tools in care planning. Early identification of patients with moderate symptom burden may allow for timely interventions that prevent progression to severe states, ultimately improving overall health-

related quality of life.Age-related disparities in QoL were also evident, with older patients reporting significantly lower global health scores. This finding aligns with existing evidence suggesting that ageing is associated with increased vulnerability to both symptom burden and psychosocial challenges. Tailoring supportive care interventions to the needs of older adults, including cognitive and functional assessments, may enhance treatment outcomes and preserve independence. Psychosocial support emerged as a critical component of comprehensive care. Patients with access to robust emotional and practical support networks demonstrated reduced levels of anxiety, depression, and psychological distress, which positively influenced treatment engagement and adherence.[10] Routine psychosocial screening and the availability of interventions such as counselling, peer support, and spiritual care should be considered essential components of standard oncology care pathways, as supported by prior recommendations.

Furthermore, consistent with previous research, our study indicates that up to 40% of patients report clinically significant depressive symptoms, with a considerable proportion also experiencing persistent anxiety. The presence of such psychological morbidity has been shown to worsen physical symptoms and independently predict poorer clinical outcomes[11]. The integration of validated QoL instruments such as the EORTC QLQ-C30 and LC13 into routine assessments can facilitate early identification and timely referral to psycho-oncology services, including pharmacological intervention when clinically indicated[12]. Finally, the dynamic nature of QoL, which varies with disease progression, treatment phase, and contextual factors (e.g., employment status, family support), highlights the necessity of ongoing assessment. Embedding structured QoL evaluations within clinical workflows will support early detection of emerging needs and foster a more patient-centered approach to decision-making.

CONCLUSION

The findings from this study highlight the importance of adopting a holistic, adaptive approach to lung cancer care in India. Strategies must account for the multifactorial interplay of physical symptoms, psychological distress, and sociodemographic context. Future research should evaluate the efficacy of integrated care models combining symptom control, psychosocial support, and longitudinal QoL monitoring to guide best practices and improve outcomes across diverse patient populations.

Disclosures

Acknowledgment(s): The authors extend their sincere gratitude to the patients who participated in this study and to the clinical staff who assisted with the administration and collection of paper-based questionnaires. Their cooperation was invaluable to the completion of this research.

Source(s) of Support and Funding: This study received no external funding.

Conflict of Interest Statement: The author declares no conflict of interest.

Consent to Participate: Written informed consent was obtained from all participants.

Ethical Approval: The study protocol was reviewed and approved by the Institutional Review Board (IRB) of Rajiv Gandhi Cancer Institute and Research Centre.

REFERENCES

1. Singh, N., Agrawal, S., Jiwnani, S., Khosla, D., Malik, P., Mohan, A., Penumadu, P., & Prasad, K. (2021). Lung Cancer in India.. Journal of thoracic oncology : official publication of the International Association for the Study of Lung Cancer, 16 8, 1250-1266 . https://doi.org/10.1016/j.jtho.2021.02.004.
2. Polański, J., Jankowska-Polańska, B., Rosińczuk, J., Chabowski, M., & Szymańska-Chabowska, A. (2016). Quality of life of patients with lung cancer. OncoTargets and therapy, 9, 1023 - 1028. https://doi.org/10.2147/OTT.S100685.
3. Jin, H., & Liu, W. (2013). Influencing factors of life quality in lung cancer patients. Journal of International Oncology, 40, 447-449. https://doi.org/10.3760/CMA.J.ISSN.1673-422X.2013.06.015.
4. Jacob, J., Palat, G., Verghese, N., Chandran, P., Rapelli, V., Kumari, S., Malhotra, C., Teo, I., Finkelstein, E., & Ozdemir, S. (2019). Health-related quality of life and its socio-economic and cultural predictors among advanced cancer patients: evidence from the APPROACH cross-sectional survey in Hyderabad-India. BMC Palliative Care, 18. https://doi.org/10.1186/s12904-019-0465-y.

5. Braun DP, Gupta D, Staren ED. Quality of life assessment as a predictor of survival in non-small cell lung cancer. BMC Cancer. 2011;11:353
6. Nath, A., Sathishkumar, K., Das, P., Sudarshan, K., & Mathur, P. (2022). A clinico epidemiological profile of lung cancers in India – Results from the National Cancer Registry Programme. Indian Journal of Medical Research, 155, 264 - 272. https://doi.org/10.4103/ijmr.ijmr_1364_21.
7. European Organisation for Research and Treatment of Cancer. (n.d.). *European Organisation for Research and Treatment of Cancer (EORTC)*. https://www.eortc.org/
8. Husson, O., de Rooij, B. H., Kieffer, J., Oerlemans, S., Mols, F., Aaronson, N. K., van der Graaf, W. T. A., & van de Poll-Franse, L. V. (2019). The EORTC QLQ-C30 summary score as prognostic factor for survival of patients with cancer in the real-world: Results from the population-based PROFILES registry. *The Oncologist*, 25(4), e722–e732.https://doi.org/10.1634/theoncologist.2019-0348
9. Mock V, Atkinson A, Barsevick A, et al. NCCN practice guidelines for cancer-related fatigue. Oncology. 2000;14(11A):151–161
10. Sak J, Sagan D, Wiechetek M, Pawlikowski J. Suboptimal perception of illness due to self-realization constraints impairs psychological welfare in surgical patients. Eur J Cardiothorac Surg. 2012;41:824–828
11. Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The Prevalence of psychological distress by cancer site. Psycho Oncology.2001;10(1):19–28.
12. Carlsen K, Jensen AB, Jacobsen E, Krasnik M, Johansen C. Psycho-social aspects of lung cancer. Lung Cancer. 2005;47(3):293–300