

Burden of Fatigue and Dyspnea and Their Association with Health-Related Quality of Life Among Cancer Patients: An Analytical Cross-Sectional Study

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Abstract:

➤ *Background:*

Fatigue, dyspnea, and impaired quality of life (QoL) are among the most commonly reported symptoms in cancer patients. These symptoms can significantly impact functional independence, emotional well-being, and treatment outcomes. Identifying the prevalence of these symptoms can guide more effective supportive care and rehabilitation strategies.

➤ *Aim:*

To determine the prevalence of fatigue and dyspnea and its association with health related quality of life among various types of cancer patients.

➤ *Materials and Methods:*

An Analytical cross-sectional study was conducted involving 205 cancer patients, including individuals diagnosed with lung, breast, oral cavity, liver, prostate, thyroid, and other cancers. Participants were assessed using standardized tools: fatigue was evaluated using the Brief Fatigue Inventory Scale, dyspnea was measured with the Modified Medical Research Council (mMRC) Dyspnea Scale, and quality of life was assessed using the EORTC QLQ-C30 questionnaire. Data were analyzed to determine the overall cancer-type-specific prevalence of fatigue, dyspnea and impaired quality of life.

➤ *Result:*

Out of 205 patients Fatigue was reported in 163 patients(79.5%), Dyspnea in 121 (59%) patients and Impaired quality of life in 147 patients (71.7%) from which Lung cancer patients showed the highest prevalence of fatigue (90.3%), dyspnea (83.9%) and impaired quality of life (87.1%), Breast cancer patients reported fatigue as (77.5%) with impaired quality of

life in (69.2%) and dyspnea as (48%). Patients with oral, liver, and prostate cancer also demonstrated significant levels of these symptoms, through slightly lower in comparison to lung cancer. Fatigue and dyspnea showed very strong positive correlation with impaired quality of life, where fatigue ($r = 0.96$, $p = < 0.0005$), while dyspnea ($r = 0.95$, $p = < 0.0012$). These findings indicate that increased fatigue and dyspnea are associated with greater deterioration in quality of life.

➤ Conclusion:

This analytical cross-sectional study demonstrated a substantial burden of fatigue and dyspnea among cancer patients, particularly in those with lung, oral, and breast cancers. Higher symptom burden was significantly associated with poorer health-related quality of life. These findings emphasize the importance of routine symptom assessment and early multidisciplinary management to optimize patient well-being.

Keywords: Fatigue, Dyspnea, Quality of Life, Cancer, Prevalence, EORTC QLQ- C30, BFI, mMRC.

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I. INTRODUCTION

Cancer remains a leading cause of morbidity and mortality worldwide. According to the International Agency for Research on Cancer (IARC) and the World Health Organization (WHO), there were approximately 20 million new cancer cases and 10 million cancer-related deaths reported globally in 2024.^[1] In India, cancer is the second leading cause of mortality, accounting for nearly 9% of all deaths, with the most common types being breast, lung, oral, and colorectal cancers.^[2]

Cancer is a broad term for a large group of diseases that are characterized by the uncontrolled growth and proliferation of abnormal cells. These cells have the ability to invade surrounding tissues and may spread to distant parts of the body through the bloodstream and lymphatic system, a process known as metastasis. Unlike normal cells, cancer cells bypass normal regulatory mechanisms of the cell cycle, resist cell death (apoptosis), and often exhibit genetic mutations that promote tumor growth and survival.^[3]

Cancer can arise in virtually any tissue or organ and is classified according to the type of cell or organ affected. The major categories include Carcinomas (originating in epithelial cells), Sarcomas (from connective or supportive tissues), Leukemia's (cancers of the blood and bone marrow), Lymphomas and myelomas (originating in immune system cells).^[4] Cancer development is influenced by a range of factors, including genetic predisposition, environmental exposures (e.g., tobacco smoke, air pollution, occupational carcinogens), infections (such as human papillomavirus, hepatitis B and C), and lifestyle behaviors (e.g., unhealthy diet, sedentary habits, excessive alcohol use).^[5]

Advances in diagnosis and treatment have improved survival, but the physical and psychological burden of the disease continues to challenge patient's functional status and overall well-being.^[6] The most frequently diagnosed cancers in 2024 globally were breast, lung, colorectal, prostate, and liver cancer.^[7] The global and India cancer prevalence 2024 estimates ~ 6.06 million new case globally and ~ 1,55,000 new cases in India respectively as shown in Table 1 and Table 2.^{[7] [2]}

Table 1 Global Cancer Prevalence – 2024 Estimates

Cancer Type	Global Rank	New Cases	% of Total Cases	Deaths	% of Total Deaths
Lung Cancer	1 st	~2.40 million	11.10%	~1.81 million	17.80%
Breast Cancer	2 nd	~2.42 million	11.60%	~6,80,000	6.70%
Colorectal Cancer	3 rd	~2 million	9.60%	~1.02 million	10%
Prostate Cancer	4 th	~1.61 million	7.80%	~3,75,000	3.70%
Stomach Cancer	5 th	~1.12 million	5.40%	~8,19,000	8.00%
Liver Cancer	6 th	~9,00,000	4.40%	~8,30,000	8.10%
Cervical Cancer	7 th	~6,00,000	2.90%	~3,40,000	3.30%
Esophageal Cancer	8 th	~6,00,000	2.90%	~5,40,000	5.30%
Thyroid Cancer	9 th	~5,70,000	2.90%	~45,000	0.40%
Bladder Cancer	10 th	~5,50,000	2.70%	~2,20,000	2.20%
Other Cancer	---	~6.06 million	29.10%	~3.37 million	33%

Table 2 India Cancer Prevalence – 2024 Estimates

Cancer Type	India Rank	New Cases	% of Total New Cases	Deaths	% of Total Deaths
Breast Cancer	1st	~ 2,10,000	18.5%	~ 85,000	15.2%
Lung Cancer	2nd	~ 95,000	8.4%	~ 82,000	14.6%
Oral Cavity Cancer	3rd	~ 87,000	7.7%	~ 49,000	8.8%
Cervical Cancer	4th	~ 78,000	6.9%	~ 42,000	8.9%
Colorectal Cancer	5th	~ 65,000	5.7%	~ 39,000	8.0%
Stomach Cancer	6th	~ 60,000	5.3%	~ 50,000	7.5%
Esophageal Cancer	7th	~ 55,000	4.9%	~ 45,000	7.0%
Prostate Cancer	8th	~ 47,000	4.1%	~ 23,000	6.8%
Liver Cancer	9th	~ 40,000	3.5%	~ 38,000	4.1%
Thyroid Cancer	10th	~ 26,000	2.3%	~7,000	1.3%
Other Cancer	---	~ 1,55,000	13.6%	~ 1,00,000	17.8%

Cancer patients frequently experience a wide range of physical and psychological symptoms, with fatigue and dyspnea among the most distressing. These symptoms significantly impair daily functioning and quality of life, and their prevalence increases as the disease progresses or treatment intensifies. Cancer-related fatigue (CRF) is a persistent and subjective sense of tiredness or exhaustion that is not proportional to activity and is not relieved by rest. Unlike normal fatigue, CRF can severely affect physical, emotional, and cognitive functioning, and can last for months or even years post-treatment. Studies report that between 70–90% of cancer patients experience fatigue during chemotherapy, radiation therapy, or immunotherapy.^[8] It impairs daily activities, reduces independence, and contributes to emotional distress, often leading to decreased quality of life.

Dyspnea, or shortness of breath, is another commonly reported symptom, particularly in patients with thoracic malignancies or advanced-stage disease. It can arise due to a variety of causes such as tumor compression, pleural effusion, anemia, or treatment-related complications like radiation pneumonitis. Dyspnea affects up to 50–70% of patients with advanced cancer and is often associated with anxiety, reduced mobility, and poor treatment tolerance.^[9] It significantly limits physical activity and is often perceived by patients as a sign of disease progression or terminal decline, further contributing to psychological burden.

The cumulative effect of such symptoms contributes to a marked decline in quality of life (QoL). QoL is a multidimensional concept that includes physical health, psychological state, level of independence, social relationships, and personal beliefs. In oncology, it has become a key parameter in evaluating patient outcomes beyond tumor control or survival. Instruments like the EORTC QLQ-C30 are widely used to assess the various domains of QoL in cancer patients, helping clinicians understand how treatment and disease affect the patient's day-to-day experiences.^[10] A high symptom burden, particularly from fatigue and dyspnea, has been shown to negatively impact QoL, leading to reduced treatment adherence and poorer clinical outcomes.^[11]

In the Indian context, the impact of these symptoms is further compounded by late-stage presentation, inadequate

palliative care services, financial constraints, and sociocultural stigma associated with cancer. Despite their high prevalence and impact, fatigue, dyspnea, and quality of life are often under-assessed and under-reported in clinical practice, especially in resource-limited settings.^[12] There is a pressing need to generate local, context-specific data on the prevalence and interrelationship of these factors to guide targeted supportive care strategies.

This descriptive study aims to assess the prevalence of fatigue, dyspnea, and their effects on the quality of life among cancer patients, irrespective of type and stage, to better understand the symptom burden and inform integrative care planning in oncology settings. By documenting the frequency and severity of these key symptoms, the study seeks to contribute to improved screening, early intervention, and overall patient-centered care in cancer management.

II. MATERIALS AND METHODS

Ethical clearance was obtained from Institutional Ethical Committee of Rashtrasant Janardhan Swami College of Physiotherapy, Maharashtra University of Health Sciences, Nashik (MUHS). The study was conducted in the Oncology Department of Rashtrasant Janardhan Swami Hospital and Cancer Research Center over a period of 4 months from April 2025 to June 2025. Total number of patients screened were 225, among them 205 were included in the study on the basis of Inclusion criteria. The Cancer patients attending the inpatient and outpatient departments of the oncology unit were included in the study. The sample included patients diagnosed with different types of cancer (e.g., breast, lung, gastrointestinal, head and neck, liver, oral and others) and undergoing various treatment modalities including chemotherapy, radiotherapy, surgery or palliative care and patients who were willing to submit written informed consent form were included in this study. Any critically ill patient unable to respond to questionnaires, patients with severe cognitive impairment, psychiatric illness and patients with coexisting chronic respiratory or cardiac diseases unrelated to cancer (e.g., COPD, CHF) were excluded for this study. The patients were selected randomly from Oncology Department of Rashtrasant Janardhan Swami Hospital and Cancer Research Center voluntarily. After taking written informed consent form all the 225 patients, only 205 patients were conveniently selected for further

participation in this study. All these 205 patients were assessed for Fatigue, Dyspnea and Quality of life using Brief Fatigue Inventory Scale, Modified Medical Research Council (mMRC) Dyspnea Scale and EORTC QLQ- C30 Scale.

➤ Procedure Flow Chart

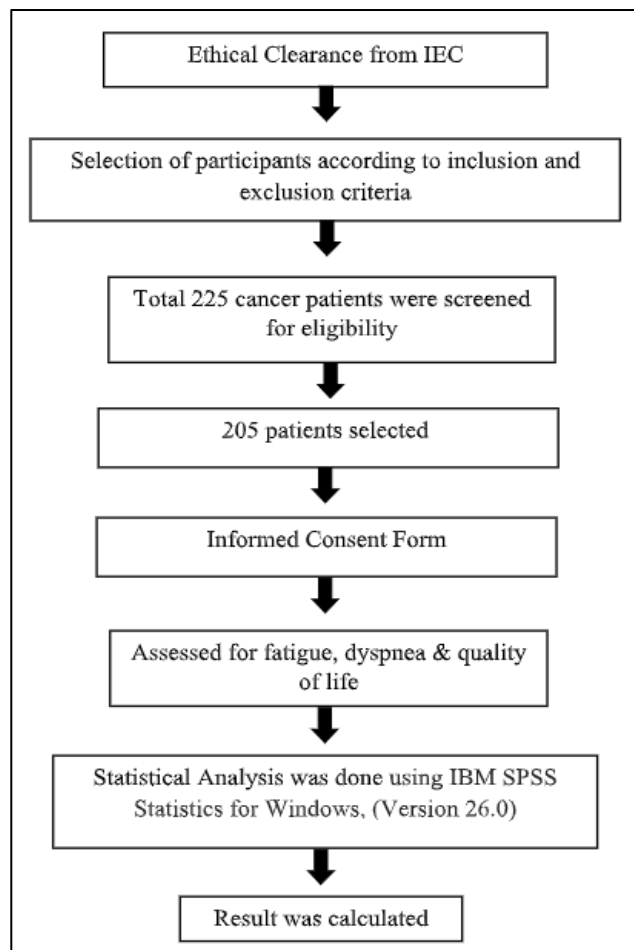


Fig 1 Procedure Flow Chart

➤ Outcome Measures

- Brief Fatigue Inventory Scale
- Modified Medical Research Council (mMRC) Dyspnea Scale
- EORTC QLQ- C30 Scale

➤ Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 26.0.

III. RESULTS

In this descriptive study involving 205 cancer patients of varied types, the prevalence of fatigue, dyspnea, and impaired quality of life (QoL) was notably high.. Fatigue emerged as the most common symptom, present in 163 patients (79.5%), Dyspnea was present in 121 patients (59%) and impaired quality of life was noted in 147 patients (71.7%). The majority of patients had lung (30.24%), Oral cavity (20%), and Breast (19.51%) cancers, while the rest included liver, prostate, thyroid and other malignancies from which Lung cancer patients showed the highest prevalence of fatigue (90.3%), dyspnea (83.9%) and impaired quality of life (87.1%), Breast cancer patients reported fatigue as (77.5%) with impaired quality of life in (69.2%) and dyspnea as (48%). Patients with oral, liver, and prostate cancer also demonstrated significant levels of these symptoms, through slightly lower in comparison to lung cancer. Fatigue and dyspnea showed very strong positive correlation with impaired quality of life, where fatigue ($r = 0.96$, $p = < 0.0005$), while dyspnea ($r = 0.95$, $p = < 0.0012$). These findings indicate that increased fatigue and dyspnea are associated with greater deterioration in quality of life.

Table 3 Demographic Data of patients

Sr. No	Demographic Variables	Category	Number (n)	Percentage (%)
1	Age (Years)	21-40	32	15.60%
		41-60	98	47.80%
		61-80	75	36.60%
2	Gender	Male	114	55.60%
		Female	91	44.40%
3	Treatment Status	Chemotherapy	84	41%
		Radiotherapy	57	27.80%
		Post- surgical	40	19.50%
		Palliative/ Supportive	24	11.70%

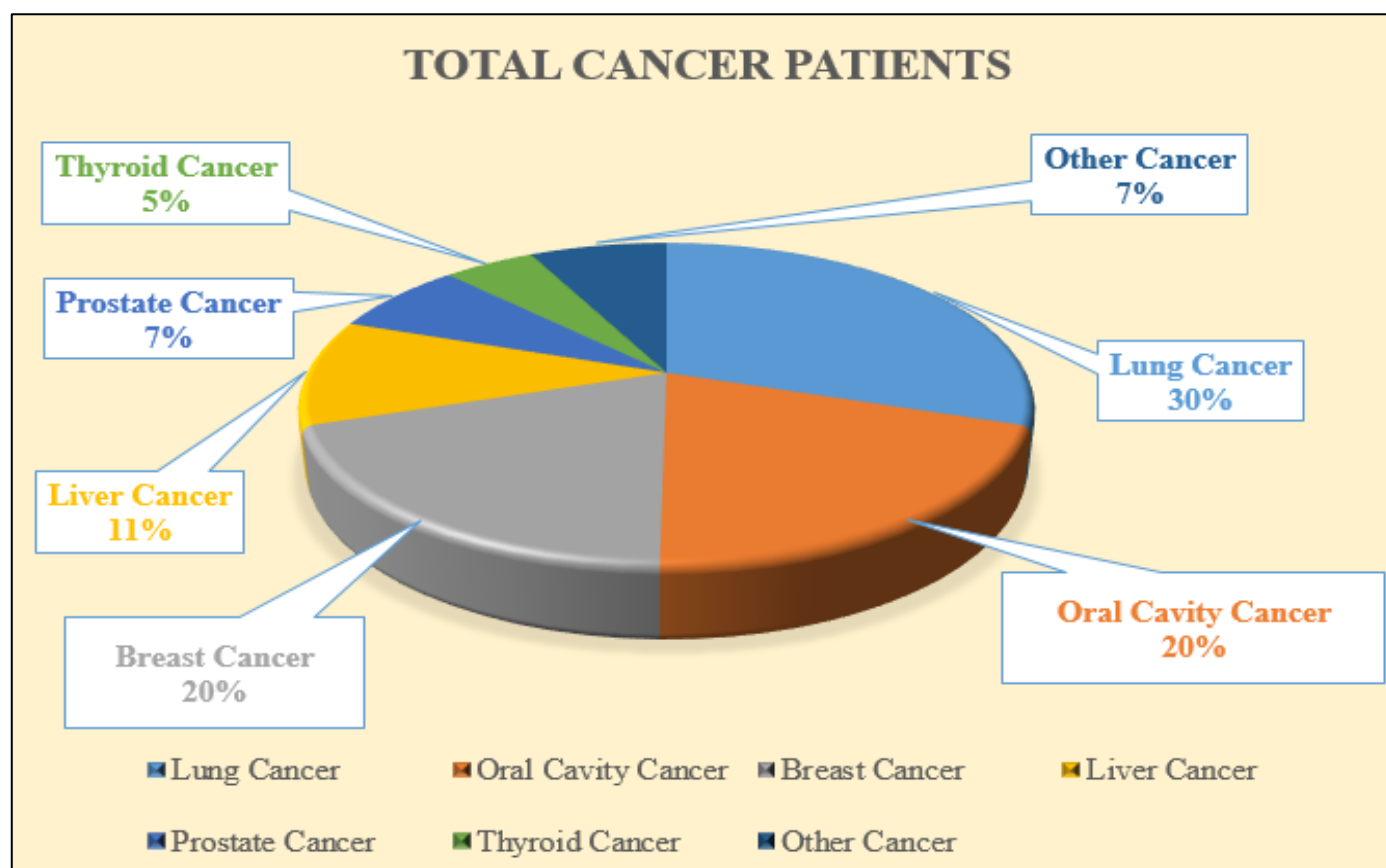


Fig 1 Total no of Cancer Patients Included in the Study (n = 205)

Table 4 Overall Symptom Prevalence

Sr. No	Symptom	Number (n)	Prevalence (%)
1	Fatigue	163	79.51%
2	Dyspnea	121	59.02%
3	Impaired Quality of Life	147	71.70%

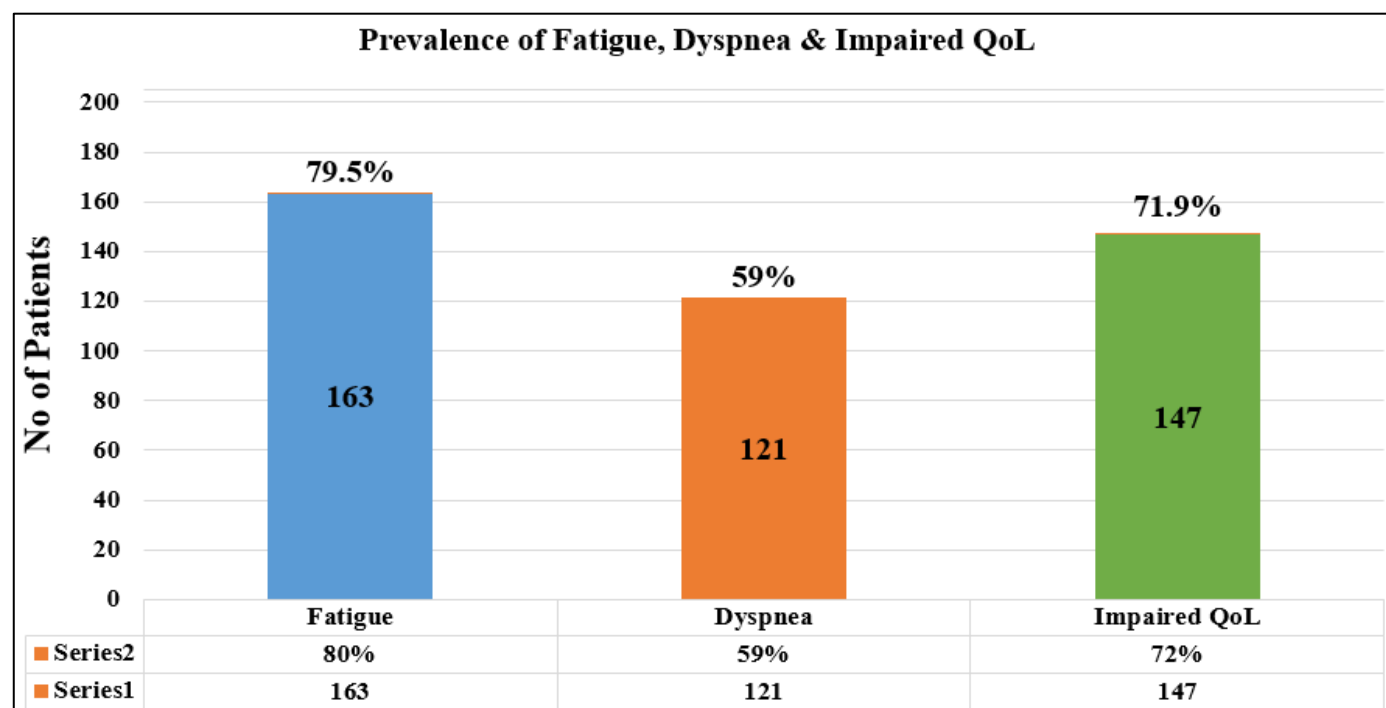


Fig 2 Overall Symptom Prevalence

Table 5 Cancer Type Wise Distribution of Patients and Symptom Prevalence

Cancer Type	Total Patients (n = 205)	Fatigue		Dyspnea		Impaired QoL	
		Patients	Percentage (%)	Patients	Percentage (%)	Patients	Percentage (%)
Lung Cancer	62	56	90.30%	52	83.90%	54	87.10%
Oral Cavity Cancer	41	31	75.60%	22	53.60%	29	70.70%
Breast Cancer	40	31	77.50%	19	47.50%	27	69.20%
Liver Cancer	22	18	81.80%	14	63.60%	16	72.70%
Prostate Cancer	15	11	73.30%	7	46.70%	10	66.70%
Thyroid Cancer	10	7	70%	4	40%	6	60%
Other Cancer	15	9	60%	3	20%	5	33.30%

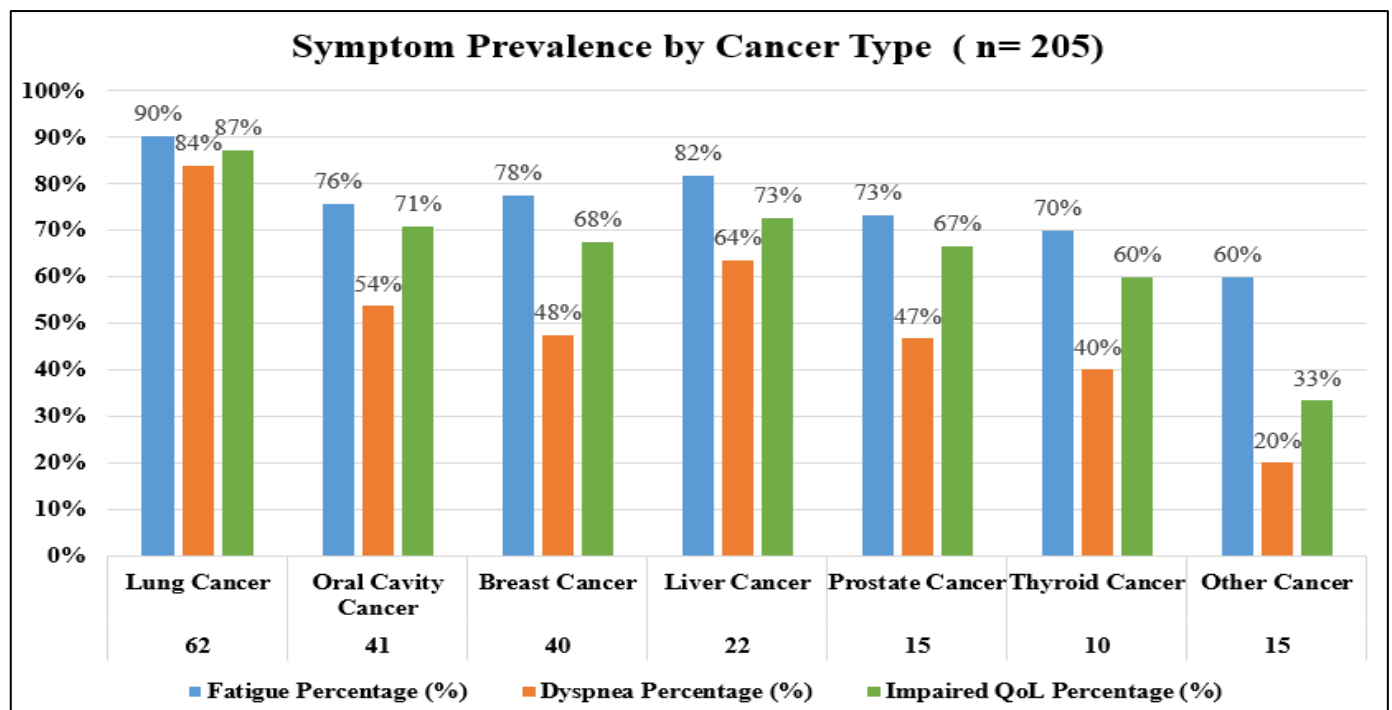


Fig 3 Symptom Prevalence by Cancer Type

IV. DISCUSSIONS

This descriptive cross-sectional study aimed to evaluate the prevalence of fatigue, dyspnea, and impaired quality of life (QoL) among patients with different types of cancer. The findings revealed a high symptom burden, with fatigue reported in 79.5%, dyspnea in 59%, and impaired QoL in 71.7% of the participants. These results align with existing literature that identifies these symptoms as among the most distressing and prevalent in cancer populations. [13,14]

Fatigue was the most commonly reported symptom, particularly in patients with lung cancer (90.3%), followed by breast (77.5%), oral (75.6%), and liver cancers (81.8%). Cancer-related fatigue is known to be multifactorial, often resulting from tumor metabolism, treatment side effects (such as chemotherapy or radiotherapy), anemia, poor nutrition, and psychological distress. [15,16] The Brief Fatigue Inventory (BFI) used in this study is a validated and reliable tool for assessing fatigue severity and its impact on daily functioning. [17] Our results are consistent with studies by Curt et al. and

Lawrence et al., who observed similarly high fatigue rates across different cancer populations. [8,18]

Dyspnea was particularly prevalent among lung cancer patients (83.9%), which is expected due to direct involvement of the respiratory system. Dyspnea in lung cancer may result from airway obstruction, pleural effusion, tumor compression, weakened respiratory muscle due to cancer related fatigue or infection. [19] Other cancer types, including liver (63.6%), oral (53.6%), and breast cancer (47.5%), also showed notable levels of dyspnea, likely due to secondary factors such as anemia, deconditioning, or anxiety. [20,21] The Modified Medical Research Council (mMRC) Dyspnea Scale effectively quantified symptom severity in these patients. [22]

The EORTC QLQ-C30 revealed that 71.7% of patients experienced impaired QoL, with the highest burden among those with lung (87.1%), oral (70.7%), and breast cancer (69.2%). Impaired QoL in cancer patients is closely related to physical symptoms like fatigue and breathlessness but also reflects psychosocial factors such as fear of disease progression, body image changes, and treatment-related

stress. ^[23,24] Previous research, including studies by Montazeri et al. and Murphy et al., supports our findings, showing a strong inverse correlation between symptom severity and QoL. ^[25,26]

Lung cancer patients had the highest prevalence across all three domains fatigue, dyspnea, and poor QoL indicating that this subgroup may benefit most from early and aggressive symptom management strategies. Similarly, patients with oral and breast cancers also demonstrated a high symptom load, possibly due to treatment complications such as mucositis, speech difficulties, and emotional distress. On the other hand, thyroid cancer and some prostate cancer patients had relatively lower symptom burden, which may be attributed to better prognosis and less aggressive disease course in early stages.

V. LIMITATIONS

Being a cross-sectional study, it captures symptoms at a single time point and does not assess their progression or response to interventions. Single center study may limit generalizability, and small sample size in certain cancer groups (e.g., thyroid, prostate) limit statistical power.

VI. CONCLUSION

This analytical cross-sectional study demonstrated a substantial burden of fatigue and dyspnea among cancer patients with greatest burden observed in lung, oral, and breast cancers. Higher levels of fatigue and dyspnea were significantly associated with poorer health-related quality of life, indicating that patients experiencing greater symptom burden tend to report lower quality of life. These findings highlight the importance of routine assessment and early management of fatigue and dyspnea as part of comprehensive cancer care to improve patients' overall well-being.

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➤ Conflict of Interest

The authors declare that they have no conflict of interest.

➤ Funding Support

The authors declare that they have no funding support for this study.

➤ Informed Consent

Informed consent was obtained from the patient.

➤ Ethical Clearance

Ethical clearance was obtained from the Institutional Ethics Committee of Rashtrasant Janardhan Swami College

of Physiotherapy Kokamthan, (MUHS, Nashik)
Ref.No.RJSCOPT/IEC/2025/45.

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