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Demographic and Clinical Determinants of Treatment Outcomes Among Hospitalized Cancer Patients: A Prospective Observational Study

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ABSTRACT

Background: Cancer remains a leading cause of morbidity and mortality worldwide, with patient outcomes influenced not only by tumor-related factors but also by demographic characteristics, nutritional status, and clinical presentation. Identification of these determinants may facilitate risk stratification and improve individualized patient management.
Objective: To evaluate the association between demographic and clinical characteristics and treatment outcomes among hospitalized cancer patients in a tertiary care center.
Methods: A hospital-based prospective observational study was conducted over 18 months at Gandhi Medical College and its associated hospitals, Bhopal. A total of 110 histopathologically confirmed cancer patients were enrolled. Demographic, clinical, nutritional, and treatment-related data were collected, and their association with treatment outcomes was analyzed using appropriate statistical methods.
Results: Most patients belonged to the older age group, with a predominance of males. Advanced-stage disease constituted a substantial proportion of admissions. Nutritional impairment and low body mass index were frequently observed. Associations were observed between selected demographic and clinical characteristics and treatment outcomes. Patients with better nutritional status and favorable performance scores demonstrated comparatively improved clinical outcomes.
Conclusion: Demographic profile, nutritional status, and disease-related clinical characteristics significantly influence treatment outcomes among hospitalized cancer patients. Comprehensive assessment of these factors at admission may support early risk identification, optimize multidisciplinary management, and improve overall patient care.

Keywords: *Cancer; Demographic characteristics; Treatment outcomes; Nutritional status; Hospitalized patients; Prospective observational study.*

INTRODUCTION

Cancer is one of the leading causes of morbidity and mortality worldwide and continues to impose a substantial burden on healthcare systems despite remarkable advances in diagnosis and treatment. According to recent global estimates, millions of new cancer cases are diagnosed annually, with a disproportionately high burden in low- and middle-income countries. Improvements in screening, multimodal therapy, and supportive care have enhanced survival; however, treatment outcomes remain highly variable because they are influenced by demographic, socioeconomic, nutritional, and disease-related factors. [1,2]

Patient demographics, including age, sex, educational status, occupation, and socioeconomic status, have a significant impact on cancer presentation and prognosis. Delayed diagnosis, poor health literacy, limited access to healthcare services,

and financial constraints frequently contribute to advanced-stage disease at presentation and inferior treatment outcomes. Furthermore, lifestyle-related factors and social determinants of health have emerged as important contributors to disparities in cancer care, particularly in developing countries. [3,4]

Clinical characteristics such as histopathological diagnosis, disease stage, nutritional status, body mass index, performance status, and associated comorbidities also play a pivotal role in determining prognosis. Malnutrition and poor nutritional reserve are common among hospitalized cancer patients and have been associated with prolonged hospitalization, treatment-related complications, reduced treatment tolerance, and increased mortality. Comprehensive evaluation of these clinical parameters is therefore essential for individualized patient management and improved clinical outcomes. [5]

Although several studies have independently evaluated demographic or clinical predictors of cancer outcomes, evidence integrating both domains among hospitalized patients from Indian tertiary care centers remains limited. Understanding the combined influence of these determinants may facilitate early identification of high-risk patients and optimize multidisciplinary management strategies.

Aim of the Study:
To assess the demographic and clinical characteristics of hospitalized cancer patients and determine their association with treatment outcomes in a tertiary care setting.

MATERIALS AND METHODS

A hospital-based prospective observational study was conducted over a period of 18 months in the Departments of Medicine, Surgery, Radiation Oncology, and Obstetrics & Gynaecology at Gandhi Medical College and its associated hospitals, Bhopal. The study included hospitalized patients with histopathologically confirmed malignancy who fulfilled the predefined eligibility criteria, irrespective of the primary cancer site. A total of 110 patients were enrolled after obtaining written informed consent. Demographic characteristics, clinical profile, nutritional assessment, histopathological findings, treatment-related variables, and clinical outcomes were recorded using a structured case record proforma.

Inclusion Criteria

- Patients aged 18 years and above.
- Histopathologically confirmed diagnosis of malignancy.
- Patients admitted for evaluation, treatment, or supportive cancer care.
- Patients willing to provide written informed consent.

Exclusion Criteria

- Patients with incomplete clinical or investigation records.
- Patients who were unwilling to participate in the study.
- Patients discharged against medical advice before completion of evaluation.
- Patients with severe cognitive impairment or inability to provide reliable clinical information without an authorized caregiver.

Ethical Approval
The study was conducted after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from all participants before enrollment, and confidentiality of patient information was maintained throughout the study in accordance with the ethical principles of the Declaration of Helsinki.

Statistical Analysis
Data were analyzed using SPSS version 26.0. Continuous variables were expressed as mean ± standard deviation, whereas categorical variables were presented as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test, as appropriate. A p-value <0.05 was considered statistically significant.

RESULTS

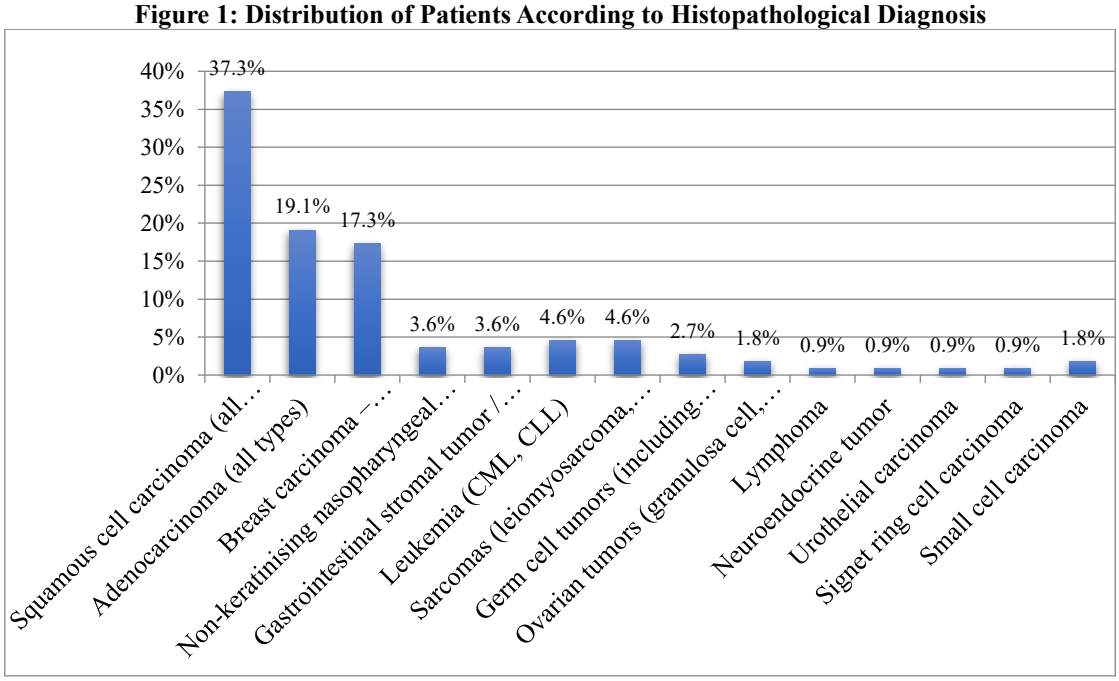
Table 1: Demographic Characteristics of the Study Participants

Demographic Characteristics		**No. of cases**	**Percentage**
Age group (Years)	<20yr	2	1.82%
	21-45yr	47	42.73%
	46-60yr	37	33.64%
	>60yr	24	21.82%
	Mean ± SD (Years)	47.8 ± 13.79	
Gender	Female	43	39.09%
	Male	67	60.91%

Education	Uneducated	86	78.18%
	Educated	24	21.82%
Addiction	No addiction	48	43.64%
	Tobacco chewing (alone or with others)	35	31.82%
	Bidi smoking	15	13.64%
	Alcohol consumption	10	9.09%
	Ganja smoking	2	1.82%
Dietary Habits	Mixed diet	69	62.73%
	Pure veg	41	37.27%

Most participants were older adults, with a predominance of males. Limited education, addiction, and mixed dietary habits were commonly observed.

Figure 1: Distribution of Patients According to Histopathological Diagnosis



A few histopathological subtypes constituted the majority of cases.

Table 2: Nutritional Status of the Study Participants According to Nutritional Scale and Body Mass Index

Nutritional Scale & BMI		**No. of cases**	**Percentage**
Nutritional Scale	Average	55	50%
	Good	25	22.7%
	Normal	1	0.9%
	Poor	29	26.4%
BMI Category (kg/m^2)	< 18.5	66	60%
	18.5 – 24.9	38	34.5%
	25 – 29.9	5	4.6%
	30 – 34.9	1	0.9%
	35 – 39.9	0	0%
	≥ 40	0	0%

Nutritional impairment and abnormal body mass index were observed in a considerable proportion of participants.

Table 3: Treatment Outcomes and Clinical Characteristics of Hospitalized Cancer Patients

Parameter	**Yes**	**Percentage**	**No**	**Percentage**
Toxicity	36	33.3%	74	67.9%
Dose Modification of Chemotherapy	21	19.1%	89	80.9%
Disease Response (Clinical and Radiological)	79	71.8%	31	28.2%
Death	2	1.8%	108	98.2%
Completed Planned Treatment	2	1.8%	108	98.2%
Ongoing Treatment	99	90%	11	10%
H/o Previous alternate treatment for cancer	105	95.5%	5	4.6%

Treatment response was observed in most patients, whereas treatment-related toxicity and chemotherapy dose modification occurred in a smaller proportion. The majority of patients remained on ongoing treatment during the study period.

DISCUSSION

Cancer remains a major public health concern, and treatment outcomes are influenced by several demographic and clinical factors. The present study evaluated the relationship between these factors and treatment outcomes among hospitalized cancer patients. The findings suggest that patient demographics, nutritional status, disease characteristics, and baseline clinical condition play an important role in determining treatment outcomes, emphasizing the need for comprehensive assessment during hospital admission. [6,7]

The demographic profile observed in the present study showed that most patients were older adults, with a predominance of males. Similar observations have been reported in recent studies, where increasing age and male sex were associated with a higher incidence of cancer and more frequent hospital admissions. Socioeconomic and educational factors have also been recognized as important determinants of healthcare access, timely diagnosis, and treatment outcomes among cancer patients. [8,9]

Nutritional assessment revealed that a substantial proportion of patients had impaired nutritional status and abnormal body mass index. Malnutrition is a common problem among patients with malignancy and has been associated with poor treatment tolerance, increased complications, prolonged hospitalization, and reduced survival. Routine nutritional assessment and timely nutritional support are therefore essential components of comprehensive cancer management. [10] The present study also demonstrated that patients with better baseline clinical status experienced comparatively favorable treatment outcomes, whereas advanced disease and poor general condition were associated with less satisfactory outcomes. These findings are consistent with previous studies highlighting that early diagnosis, multidisciplinary management, optimization of nutritional status, and individualized supportive care contribute significantly to improved clinical outcomes in patients with cancer. [11]

Overall, the findings of the present study highlight the importance of integrating demographic, nutritional, and clinical assessment into routine oncology practice. Early identification of high-risk patients may facilitate appropriate treatment planning, improve resource utilization, and ultimately enhance treatment outcomes in tertiary care settings.

CONCLUSION

The present study highlights that demographic characteristics, nutritional status, and clinical profile are important determinants of treatment outcomes among hospitalized cancer patients. Patients with better nutritional and clinical status demonstrated comparatively favorable outcomes, whereas advanced disease and poor baseline condition were associated with less satisfactory treatment responses. Early identification of high-risk patients through comprehensive clinical assessment may facilitate individualized management, optimize supportive care, and improve overall treatment outcomes. Strengthening multidisciplinary care and nutritional interventions can further enhance the quality of cancer management in tertiary care settings.

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