

Original Research Article

Healthcare-seeking pathways and out-of-pocket expenditure amongst patients attending a tertiary care government medical college in Eastern India

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ABSTRACT

Background: Cancer care imposes substantial financial burden on patients and their families, even when treatment is received at government-funded institutions. This study assessed healthcare-seeking pathways and Out-of-pocket expenditure (OOPE) among cancer patients attending a tertiary care government medical college in Eastern India.

Methods: A hospital-based cross-sectional study was conducted among 200 patients with pathologically confirmed malignancies attending the Department of Radiation Oncology of a tertiary care government medical college in West Bengal between 1st August, 2024 and 31st July, 2026. Data were collected using a semi-structured, pre-validated questionnaire, supplemented by clinical and treatment records.

Results: Of the 200 patients, 54% were female and the median age was 56 years. Most patients had a median monthly household income of ₹12,000. Breast cancer was the most common malignancy (30%). Overall, 76% patients reported a direct healthcare pathway. 64% percent of patients were referred outside the study centre, including 54% outside the city and 10% outside the state. The median total OOPE was ₹95,000. OOPE differed significantly according to referral status, with median expenditure increasing from ₹70,000 among non-referred patients to ₹1,00,000 among those referred outside the city and ₹3,00,000 among those referred outside the state ($P<0.001$). OOPE also different significantly across primary disease groups ($P<0.001$).

Conclusion: Despite treatment at a tertiary government medical college, cancer patients experience substantial OOPE and financial distress. Strengthening comprehensive surgical, radiotherapy, diagnostic, and supportive cancer services at tertiary government institutions, together with effective financial-risk protection, may help reduce the economic burden on patients and their families.

Keywords: Out of pocket expenditure, Cancer patients, health care pathways, Financial risk in cancer

INTRODUCTION

Cancer represents a major and increasing public health challenge in India. According to projections from the National Cancer Registry Programme, the annual number of new cancer cases in India was expected to reach approximately 1.5 million by 2025.¹ The increasing burden of cancer is accompanied by substantial economic

consequences for patients, families and healthcare systems.

Cancer-related expenditure extends beyond the direct cost of treatment and may include investigations, medicines, hospitalization, surgery, radiotherapy, systemic therapy, fooding, transportation, accommodation, and loss of income or productivity.² These expenditures can

accumulate over prolonged treatment periods and may impose considerable financial and psychological stress on patients and caregivers.³

Out-of-pocket expenditure (OOPE) refers to expenditure paid directly by patients or their family members for healthcare services without reimbursement from a third party. Out-of-pocket expenditure may arise from direct medical, direct non-medical, and indirect costs, while healthcare-seeking pathways and referral patterns may further influence the financial burden. In India, OOPE remains an important component of healthcare financing, and cancer is among the diseases associated with particularly high financial burden.⁴ Nationally representative data have demonstrated that cancer-related hospitalization is associated with high OOPE, catastrophic health expenditure and financial distress.⁵

The economic burden of cancer is particularly important in socioeconomically disadvantaged populations. Patients may resort to borrowing, selling assets or using household savings to finance treatment.^{4,6} Financial toxicity may subsequently result in treatment interruption, non-adherence, deterioration in quality of life and impoverishment.⁷

The financial burden is not restricted to direct medical expenditure. Patients and caregivers may incur considerable costs for transportation, accommodation, food and loss of wages, particularly when cancer treatment is available only at specialized tertiary centres.^{2,6} Recent Indian studies have demonstrated that indirect and non-medical expenditure can contribute substantially to overall cancer-related financial burden, even when patients receive care in publicly funded institutions.^{8,9}

The pathway through which patients reach a cancer treatment centre is another important determinant of timely care. Patients may initially consult private practitioners, traditional or alternative medicine providers, primary healthcare centres or secondary hospitals before reaching a tertiary cancer centre. Such indirect pathways may increase diagnostic and treatment delays and may also increase expenditure through repeated consultations, investigations and travel.^{8,10}

Although several Indian studies have examined OOPE in individual cancers, relatively fewer studies have simultaneously evaluated healthcare-seeking pathways and expenditure across different types of malignancies within a government tertiary-care setting. The present study was therefore undertaken to estimate OOPE incurred from symptom onset through cancer treatment and to describe healthcare-seeking pathways among patients attending a tertiary government medical college in Eastern India. The study also assessed expenditure according to cancer type, stage, treatment intent and referral status.

METHODS

Study design and setting

A cross-sectional hospital-based study was conducted at Midnapore Medical College and Hospital, West Bengal, India, over a period of two years from 1st August, 2024 to 31st July, 2026.

Study population

The study population consisted of adult patients with pathologically confirmed solid malignancies registered under the Department of Radiation Oncology at Midnapore Medical College and Hospital.

Patients aged >18 years with histopathologically confirmed malignancy who had received at least one form of cancer treatment or were undergoing treatment at the institute were eligible for inclusion. Patients with haematological malignancies or sarcomas, those who were unable to recall their expenditure reliably and terminally ill patients were excluded. A total of 200 patients were included using purposive sampling.

Data collection

Data were collected through face-to-face interviews using a semi-structured, pre-validated questionnaire adapted from previously published work on cancer-related OOPE.⁸ Sociodemographic, clinical and treatment-related information was obtained from patient interviews and medical records. Variables included age, sex, educational qualification, occupation, family size, marital status, monthly family income, health insurance status, insurance type, cancer type, stage, treatment intent, treatment modalities and referral status.

All patients were diagnosed on the basis of clinical assessment and histopathological confirmation. Imaging investigations, including computed tomography, magnetic resonance imaging and positron emission tomography, were performed according to clinical requirements and treating physician discretion.

Definition of healthcare-seeking pathway

For the purpose of this study, a direct healthcare-seeking pathway was defined as presentation directly to the medical college for diagnosis and treatment following the appearance of symptoms.

An indirect healthcare-seeking pathway was defined as consultation with one or more healthcare providers or healthcare facilities before reaching the medical college for definitive diagnosis and treatment.

The intermediate healthcare providers or facilities included registered medical practitioners, AYUSH

practitioners, primary healthcare centres and subdivisional hospitals.

Assessment of OOPE

OOPE was assessed from the appearance of symptoms through the period of cancer treatment covered by the interview.

The expenditure questionnaire captured direct medical, direct non-medical and indirect expenditure. Direct medical expenditure included consultation, treatment and medication-related costs. Direct non-medical expenditure included costs incurred in relation to healthcare access and associated services, while indirect expenditure included productivity and wage loss.⁸ The expenditure categories were recorded in Indian Rupees (INR).

Statistical analysis

Data were entered and analysed using IBM SPSS Statistics version 26. Continuous variables were assessed for distribution and are presented as median with range where appropriate, while categorical variables are presented as frequencies and percentages. Since out-of-pocket expenditure (OOPE) was a continuous expenditure variable with a markedly skewed distribution, non-parametric tests were used for comparative analyses.

The Mann–Whitney U test was used to compare median OOPE between two independent groups, while the Kruskal-Wallis H test was used for comparisons involving more than two groups. Post-hoc pairwise comparisons were performed where the Kruskal-Wallis H test demonstrated statistical significance. Pearson's chi-square test was used for analysis of associations between categorical variables, including categorical OOPE when dichotomised at the overall median. A two-sided P-value <0.05 was considered statistically significant.

RESULTS

Sociodemographic and healthcare-seeking characteristics

A total of 200 patients were included in the final analysis. The median age was 56 years (range 13–76 years), with the majority (132, 66%) belonging to the 40–59-year age group. Females constituted 108 (54%) of the study population. The median distance travelled to reach the treating centre was 40 km (range 2–125 km). Eighty-four patients (42%) travelled <40 km, 92 (46%) travelled 40–59 km and 24 (12%) travelled ≥60 km.

The majority of participants had primary education (120, 60%), while 60 (30%) were illiterate. Ninety-six patients (48%) were daily wage labourers and 88 (44%) were unemployed. The median monthly household income was ₹12,000 (range ₹5,000–₹60,000); 92 (46%) reported a monthly household income of ≤₹10,000. Most patients were married (180, 90%) and 104 (52%) belonged to families of four or fewer members.

Health insurance coverage was reported by 156 (78%) patients, of whom 136 (68% of the total study population) were covered under state-sponsored schemes and 20 (10%) under central government-sponsored schemes. No patient reported private health insurance.

A direct healthcare-seeking pathway was reported by 152 (76%) patients, whereas 48 (24%) initially consulted another healthcare provider or facility before reaching the tertiary care centre. Regarding referral for treatment, 72 (36%) patients were not referred outside the treating centre, while 108 (54%) were referred outside the city and 20 (10%) were referred outside the state.

Table 1. Sociodemographic and healthcare-seeking characteristics of the study population

Variables	Categories	N (%)
Sex	Male	92 (46)
	Female	108 (54)
Age group (years)	<40	16 (8)
	40–59	132 (66)
	≥60	52 (26)
Distance from treating centre	<40 km	84 (42)
	40–59 km	92 (46)
	≥60 km	24 (12)
Education	Illiterate	60 (30)
	Primary	120 (60)
	Higher secondary	12 (6)
	Graduate and above	8 (4)
Occupation	Unemployed	88 (44)
	Daily labourer	96 (48)
	Business	16 (8)

Continued.

Variables	Categories	N (%)
Family size	≤4 members	104 (52)
	>4 members	96 (48)
Marital status	Married	180 (90)
	Unmarried	20 (10)
Monthly household income	≤₹10,000	92 (46)
	₹10,001–30,000	92 (46)
	>₹30,000	16 (8)
Health insurance	Yes	156 (78)
	No	44 (22)
Insurance type	State-sponsored	136 (68)
	Central-sponsored	20 (10)
	Not insured	44 (22)
Healthcare pathway	Direct	152 (76)
	Indirect	48 (24)
Referral type	Not referred	72 (36)
	Outside city	108 (54)
	Outside state	20 (10)

Median age: 56 years (range 13–76); median distance: 40 km (range 2–125); median monthly household income: ₹12,000 (range ₹5,000–60,000)

Clinical characteristics and treatment

Breast cancer was the most common primary malignancy (60, 30%), followed by gastrointestinal malignancies (44, 22%), genitourinary/gynaecological malignancies (36, 18%), head and neck cancers (32, 16%), lung cancer (20, 10%) and lymphoma (8, 4%).

Seventy-two patients (36%) had early-stage disease (stage I–II), while 128 (64%) had advanced-stage disease (stage III–IV, including patients recorded as III+IV).

The median delay from symptom onset to first healthcare contact was 8 weeks (range 2–26 weeks). The median diagnostic delay was 4 weeks (range 1–14 weeks), while the median interval from diagnosis to initiation of treatment was 4 weeks (range 1–28 weeks).

Of the 200 patients, 156 (78%) were treated with curative intent and 44 (22%) with palliative intent. Surgery was performed in 120 (60%), chemotherapy was administered to 176 (88%), and radiotherapy to 112 (56%). Targeted therapy was received by 32 (16%) patients.

Table 2. Treatment characteristics of the study population.

Treatment characteristics	N (%)
Treatment intent	Curative
	156 (78)
	Palliative
	44 (22)
Surgery	Yes
	120 (60)
	No
	80 (40)
Chemotherapy	Yes
	176 (88)
	No
	24 (12)
Radiotherapy	Yes
	112 (56)
	No
	88 (44)
Targeted therapy	Yes
	32 (16)
	No
	168 (84)
Tri modality treatment	Surgery + chemotherapy + radiotherapy
	64 (32)
	Did not receive all three
	136 (68)
Referral	Not referred
	72 (36)
	Outside city
	108 (54)
	Outside state
	20 (10)

OOPE

The median total OOPE for the study population was ₹95,000, with a very wide range of ₹10,000–₹6,50,000. The median direct medical expenditure was ₹30,000

(range ₹5,000–₹2,50,000); direct non-medical expenditure was ₹30,000 (range ₹4,000–₹1,50,000); and indirect expenditure was ₹35,000 (range ₹1,000–₹4,00,000). Thus, non-medical and indirect expenditures together accounted for a substantial proportion of the overall financial burden.

Table 3. Components of out-of-pocket expenditure among study participants.

Component of OOPE	Median (₹)	Range (₹)
Direct medical expenditure	30,000	5,000–2,50,000
Direct non-medical expenditure	30,000	4,000–1,50,000
Indirect expenditure	35,000	1,000–4,00,000
Total OOPE	95,000	10,000–6,50,000

OOPE = out-of-pocket expenditure

Financial coping mechanisms were common. Fifty-two patients (26%) reported borrowing money and 36 (18%) reported selling assets to meet cancer-related expenditure. Treatment interruption because of financial constraints was reported by 40 (20%) patients. Twenty patients (10%) fulfilled the study criteria for catastrophic expenditure, while 84 (42%) reported financial distress.

Median OOPE varied substantially according to the primary cancer diagnosis. The highest median OOPE was observed among patients with head and neck cancer (₹1,85,000), followed by breast cancer (₹1,00,000), lymphoma (₹1,00,000), gastrointestinal malignancies (₹90,000), lung cancer (₹80,000) and genitourinary/gynaecological malignancies (₹65,000). The difference in OOPE across primary disease groups

was statistically significant on Kruskal-Wallis's analysis (H-33.445, df-5, $p < 0.001$).

Referral status demonstrated a strong relationship with OOPE. Patients who were not referred had a median OOPE of ₹70,000, compared with ₹1,00,000 among those referred outside the city and ₹3,00,000 among those referred outside the state.

The difference across the three referral groups was highly statistically significant (Kruskal-Wallis H-47.250, df-2, $p < 0.001$). Pairwise analysis demonstrated significant differences between the referral categories. When OOPE was additionally dichotomised at the overall median of ₹95,000, referral type remained significantly associated with expenditure category (Pearson χ^2 -27.664, df-2, $p < 0.001$).

Table 4. Median OOPE according to primary disease, disease stage, referral type and treatment modality.

Variables	Categories (N)	Median Total OOPE (₹)	P value
Primary disease	Breast (60)	1,00,000	<0.001
	Gastrointestinal (44)	90,000	
	Genitourinary/Gynaecological (36)	65,000	
	Head & Neck (32)	1,85,000	
	Lung (20)	80,000	
	Lymphoma (8)	1,00,000	
Referral status	Not referred (72)	70,000	<0.001
	Referred outside city (108)	1,00,000	
	Referred outside state (20)	3,00,000	
Tri modality treatment	No (136)	92,500	0.062
	Yes (64)	1,00,000	
Disease stage	Early stage (I–II) (72)	1,00,000	0.679
	Advanced stage (III–IV) (128)	90,000	

OOPE = out-of-pocket expenditure

The median OOPE was ₹1,00,000 among patients receiving tri-modality treatment compared with ₹92,500 among those who did not receive all three modalities. Although the median expenditure was numerically higher among patients receiving tri-modality treatment, the

difference did not reach conventional statistical significance (Mann-Whitney U-5063.5, $P=0.062$).

When OOPE was categorised into $\leq$ ₹95,000 and $>$ ₹95,000, there was likewise no statistically significant

association between Tri modality treatment and expenditure category (Pearson χ^2 -1.013, df-1, P=0.314).

Patients with early-stage disease had a median OOPE of ₹1,00,000 compared with ₹90,000 among those with advanced-stage disease. This difference was not statistically significant (Mann-Whitney U-4771, P-0.679).

Thus, in the present study, disease stage was not significantly associated with OOPE.

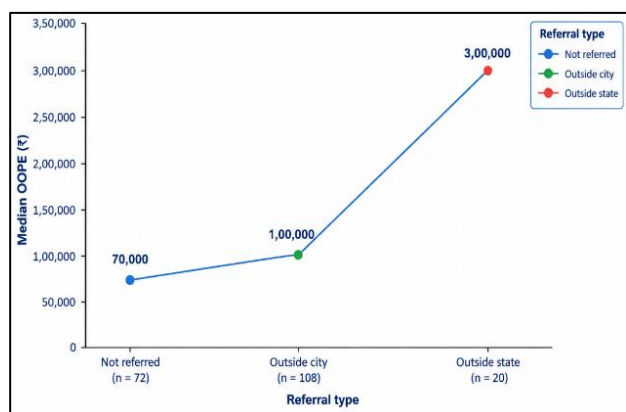


Figure 1: Median OOPE according to referral type.

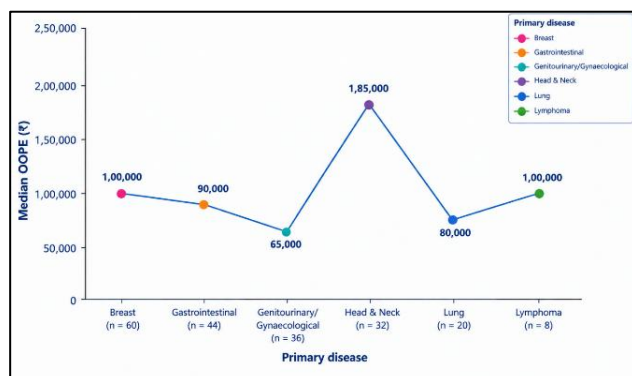


Figure 2: Median OOPE according to primary disease

DISCUSSION

The present study demonstrates that cancer care in a tertiary government medical college setting continues to impose a substantial financial burden on patients and their families despite the availability of publicly funded healthcare. The overall median OOPE was ₹95,000, with a remarkably wide range extending from ₹10,000 to ₹6,50,000. This finding is consistent with previous Indian studies demonstrating substantial variability in cancer-related financial burden according to cancer type, treatment modality, healthcare facility and socioeconomic circumstances.^{8,11-18}

The predominance of patients from economically vulnerable backgrounds is an important feature of this cohort. Almost half of the participants reported a monthly household income of $\leq$ ₹10,000, while 78% had some form

of health insurance, predominantly through state-sponsored schemes. Nevertheless, 26% reported borrowing money, 18% sold assets and 20% experienced treatment interruption because of treatment-related costs. These findings illustrate that insurance coverage alone does not necessarily eliminate financial toxicity. Previous Indian literature has similarly demonstrated persistent out-of-pocket expenditure despite publicly financed health insurance, particularly because several components of cancer care including transportation, accommodation, food, informal expenditure and productivity loss may remain outside the scope of reimbursement.¹³⁻¹⁹

The median total OOPE of ₹95,000 in the present study is broadly comparable with the expenditure reported from other tertiary cancer-care settings in India. Mohiuddin et al. reported a mean OOPE of ₹84,643 among cancer patients attending a tertiary centre in Hyderabad, with substantial variation according to cancer type and treatment modality.⁸ The present study additionally highlights the importance of indirect and non-medical expenditure, with median indirect expenditure alone reaching ₹35,000. The economic burden of cancer therefore extends considerably beyond the direct cost of antineoplastic treatment.^{6,12,18}

Referral and OOPE

One of the strongest findings of this study was the statistically significant association between referral type and OOPE. Median expenditure increased progressively from ₹70,000 among patients who were not referred, to ₹1,00,000 among those referred outside the city and ₹3,00,000 among those referred outside the state (**P<0.001**). This relationship remained significant even when OOPE was dichotomised around the overall median (χ^2 -27.664, df-2, P<0.001).

This finding is clinically and economically important. The requirement for referral outside the treating city inevitably introduces additional expenditure related to transportation, accommodation, food, repeated visits and loss of wages for both patients and caregivers. Evidence from Indian studies has similarly demonstrated that geographical mobility and distance from specialised cancer centres can substantially increase non-medical expenditure and financial burden.^{2,9,21}

In the present setting, the absence of a dedicated surgical oncology unit and limitations in radiotherapy infrastructure, including availability of radiotherapy machines, may contribute to the need for multiple external referrals. Consequently, some patients require treatment outside the city and, in selected circumstances, choose or require treatment outside the state. Such external treatment pathways are likely to increase transportation, accommodation, wage-loss and other indirect costs in addition to treatment-related expenses. This interpretation should be considered as a plausible explanation based on

the healthcare infrastructure of the study setting rather than as a demonstrated causal relationship.

The high expenditure among patients referred outside the state is particularly notable. In the present cohort, the median OOPE reached ₹3,00,000 in this group. This suggests that the financial consequences of cancer care may be determined not only by the biological characteristics of the disease but also by the organisation and geographical accessibility of cancer services.

Very wide range of OOPE

The very broad range of OOPE in this study, from ₹10,000 to ₹6,50,000 is another important observation. This variability is unlikely to be explained solely by differences in treatment modality. A proportion of patients had already travelled to major cancer-treatment centres in other cities, including Mumbai, Vellore, Bhubaneswar and other urban centres, for their primary cancer treatment or earlier components of care. Such patients may incur substantial expenditure before subsequently presenting to the government medical college for continuation, completion or further management of treatment.

Consequently, the OOPE captured in this study should be interpreted as the expenditure reported by patients across their cancer-care pathway rather than as expenditure generated exclusively within the study institution. This also provides a plausible explanation for the presence of exceptionally high expenditure values and reinforces the importance of considering the entire healthcare-seeking pathway when estimating the economic burden of cancer.

Tri modality treatment and OOPE

Patients receiving Tri modality treatment, defined in this study as surgery, chemotherapy and radiotherapy, had a higher median OOPE than those who did not receive all three modalities (₹1,00,000 vs ₹92,500). However, the difference did not reach statistical significance (P=0.062).

The direction of the association is clinically plausible because Tri modality treatment involves multiple treatment episodes, repeated hospital visits, investigations, transportation requirements and potentially longer periods of treatment-related productivity loss. Previous studies have demonstrated that treatment modality is an important determinant of cancer-related financial burden.^{6,8,12,14,18}

The absence of statistical significance in the present study may reflect the relatively modest sample size, substantial heterogeneity in treatment pathways and the contribution of other major sources of expenditure, particularly referral-related and indirect costs. The P value of 0.062 suggests a numerical difference that warrants consideration, but it should not be described as statistically significant.

Disease stage and OOPE

Interestingly, disease stage was not significantly associated with OOPE in the present study. Median OOPE was ₹1,00,000 in early-stage disease compared with ₹90,000 in advanced-stage disease (P=0.679).

At first glance, this finding may appear counterintuitive because advanced disease frequently requires prolonged systemic therapy, palliative interventions and repeated healthcare utilisation and has been associated with financial toxicity in previous literature.^{11,12} However, the pattern observed in the present cohort may be partly explained by differences in treatment intensity across stages.

In particular, among breast cancer patients, early-stage disease was more likely to receive a complete Tri modality treatment pathway. In the present data set, all 12 patients with stage II breast cancer received surgery, chemotherapy and radiotherapy, whereas only 8 of the 20 patients with stage IV breast cancer received all three modalities. Thus, patients with potentially curable early breast cancer may incur substantial expenditure because they undergo surgery followed by systemic therapy and radiotherapy, whereas many patients with stage IV disease may not undergo definitive surgery or radiotherapy and may instead receive predominantly palliative systemic treatment.

This treatment-pattern difference may partly offset the expected increase in expenditure associated with advanced-stage disease. It is therefore plausible that treatment intensity and treatment intent may have a stronger immediate influence on OOPE than stage alone in this particular cohort. Nevertheless, this explanation should be regarded as a hypothesis generated from the observed treatment pattern rather than as an independently demonstrated causal mechanism.

Primary disease and OOPE

A statistically significant difference in OOPE was observed across primary disease groups (Kruskal–Wallis H=33.445, df=5, P<0.001). Head and neck cancers had the highest median OOPE (₹1,85,000), followed by breast cancer (₹1,00,000), lymphoma (₹1,00,000), gastrointestinal cancers (₹90,000), lung cancer (₹80,000) and genitourinary/gynaecological malignancies (₹65,000).

Differences between cancer types may reflect variation in treatment requirements, referral patterns, duration of treatment, investigations, need for multimodality treatment and the extent to which patients require treatment outside the local healthcare system. Previous studies have also demonstrated cancer-specific differences in OOPE.^{8,9,14,18}

The particularly high expenditure observed among head and neck cancer patients may also reflect the socioeconomic and treatment characteristics of this population, including repeated hospital visits, surgery, radiotherapy, nutritional support, travel and prolonged treatment-related productivity losses.^{5,9}

Healthcare-seeking pathway and financial burden

Although 76% of patients in the present study reported a direct pathway to the tertiary government medical college, a substantial proportion had experienced referral or movement across healthcare facilities before or during cancer treatment. Previous studies from India have documented complex pathways to cancer diagnosis and treatment, particularly among patients from economically disadvantaged or geographically remote populations.^{7,10}

The findings emphasise that financial toxicity is not simply a consequence of the price of anticancer treatment. It is the cumulative result of where patients first seek care, how many facilities they visit, how far they travel, whether definitive services are locally available, the treatment modalities required and the extent of productivity loss.^{12,16,18,21} However the health care delays reported in this study is at par with other Indian studies.²²

Strengthening decentralised cancer-care infrastructure, improving availability of radiotherapy and surgical oncology services, facilitating timely referral and providing travel and accommodation support could therefore potentially reduce the non-treatment component of OOPE. Public financing mechanisms need to consider these additional costs if the goal is meaningful financial risk protection rather than merely reimbursement of selected treatment components.^{19,20}

Implications for cancer-care policy

The present findings support the need for a broader approach to financial protection in cancer care. Expansion of publicly funded cancer treatment should be accompanied by strengthening of treatment capacity at district and regional levels, particularly radiotherapy and surgical oncology services. Better geographical distribution of cancer services could reduce avoidable travel and external referrals.

In addition, patient-support mechanisms such as subsidised transportation, accommodation near cancer centres, nutritional assistance and wage-loss support may be particularly relevant for patients travelling long distances. Such measures could reduce the indirect and non-medical components of OOPE, which remain important contributors to overall financial toxicity.^{14,17,21}

Limitations

This study has several limitations. First, it was a single-centre cross-sectional study conducted in a tertiary

government medical college and used purposive sampling; therefore, the findings may not be generalisable to all cancer-care settings. Second, expenditure data were collected by patient interview and were therefore subject to recall bias, particularly for expenditure incurred before presentation to the study centre. Third, OOPE represents expenditure reported up to the point of assessment and does not capture the complete lifetime or longitudinal financial burden of cancer.

Fourth, the study did not undertake a multivariable analysis to determine independent predictors of OOPE. The observed relationships between referral, treatment modality, disease stage and primary disease may therefore be influenced by confounding factors. Finally, the study excluded certain malignancy categories and therefore does not represent the expenditure profile of all cancers.

CONCLUSION

Cancer care in this tertiary government medical college population was associated with substantial out-of-pocket expenditure, with a median total OOPE of ₹95,000 and a wide range extending to ₹6,50,000. Referral outside the city or state was strongly associated with higher expenditure, while OOPE also differed significantly according to primary cancer type. Tri modality treatment was associated with a numerically higher median OOPE, although this difference was not statistically significant. Disease stage was not significantly associated with OOPE, potentially reflecting the higher treatment intensity among selected early-stage patients, particularly those receiving Tri modality treatment for breast cancer.

The findings highlight that the economic burden of cancer extends beyond direct treatment costs and is strongly influenced by geographical accessibility, referral pathways and indirect expenditure. Strengthening local surgical oncology and radiotherapy infrastructure, reducing avoidable external referrals and improving financial and logistical support for patients who require travel may help reduce the financial burden of cancer care.

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