Financial Toxicity in Patients with a History of Extremity and Pelvic Sarcoma Surgery: A Retrospective Study

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INTRODUCTION:
Financial toxicity, defined as the economic burden and psychosocial distress of cancer care, has been associated with poor clinical outcomes, including reduced medication adherence and delayed treatment. Despite high projected treatment costs, data on financial toxicity in patients with sarcoma in the United States remain limited. The objective of this study was to characterize financial toxicity in patients with sarcoma, to better inform screening practices in patients with rare cancers requiring complex, multidisciplinary treatment plans.
METHODS:
We conducted a retrospective cohort study and telephone survey of patients diagnosed with trunk or extremity sarcomas in 2016-2024. Patients were administered the Comprehensive Score for Financial Toxicity (COST), which is validated in patients with cancer. Scores range from 0-44; financial toxicity was categorized into moderate-to-severe (COST <26), and low-to-none (score ≥26) groups. Demographic and clinical data were obtained from electronic medical records. Univariate logistic regression analyses were used to explore clinical and demographic factors associated with financial toxicity.
RESULTS:
Among 205 participants, 77% reported moderate-to-severe financial toxicity. Patients were less likely to report financial toxicity if they had soft tissue sarcomas (vs bone sarcomas; OR 0.43 [95% CI 0.18 – 0.98]). The odds of financial toxicity were higher, though not statistically significant, among patients with Medicaid insurance (OR 4.14 [0.90 – 19.05]), minoritized races and ethnicities (OR 1.59 [95% CI 0.78 – 3.25]), and lower extremity involvement (OR 2.02 [0.91 – 4.48]).
DISCUSSION AND CONCLUSION: Financial toxicity is highly prevalent among patients with a history of sarcoma. Given the lack of significant association with demographic characteristics, universal financial toxicity screening should be recommended for patients with newly diagnosed sarcomas. Moving forward, interventions to reduce the financial burden of care on patients with sarcoma must be explored. Additionally, future studies should evaluate financial toxicity in patients with other rare diseases requiring complex, multidisciplinary treatment plans.

Table 1: Univariate Logistic Regression Results; Demographic Characteristics as Associative Factors for Financial Toxicity
Legend: An overview of odds ratios (ORs), 95% confidence intervals (CI), and p-values from univariate logistic regression models assessing demographic variables as predictors of financial toxicity.

Variable	OR (95%CI)	p-value
Age at Diagnosis	1.02 (0.99 – 1.04)	0.06
Race/Ethnicity		
Non-Hispanic White	Ref	Ref
Minoritized	1.59 (0.78 – 3.25)	0.21
Education Level		
< High School	Ref	Ref
> High School	0.89 (0.41 – 1.93)	0.76
Insurance Status		
Private	Ref	Ref
None/Uninsured/Other	3.22 (0.68 – 15.11)	0.14
Medicaid	4.14 (0.90 – 19.05)	0.07
Medicare	2.01 (0.97 – 4.16)	0.06
Income		
<$60,000	Ref	Ref
>$60,000	0.60 (0.29 – 1.24)	0.17
Area Deprivation Index (ADI)		
National ADI %ile (SD)	1.00 (0.98 – 1.02)	0.82
Urbanicity		
Metropolitan	Ref	Ref
Non-Metropolitan	1.99 (0.82 – 4.80)	0.13
Distance from Duke		
Miles (continuous)	1.00 (0.99 – 1.01)	0.28
Minutes (continuous)	1.00 (0.99 – 1.01)	0.30

Table 2: Univariate Logistic Regression, Disease Characteristics at Diagnosis as Predictive Factors of Financial Toxicity
Legend: An overview of univariate logistic regression results evaluating clinical features, including tumor size, histologic subtype, grade, anatomic site, disease course, treatment modalities (surgery, chemotherapy, radiation), and complications, as predictors of financial toxicity. Results are given as odds ratios (ORs), 95% confidence intervals (CI), and p-values.

Variable	OR (95% CI)	P value
Size in Greatest Dimension at Diagnosis (mean (SD), cm)	0.97 (0.91 – 1.04)	0.38
Type of Sarcoma		
Bone	Ref	Ref
Soft Tissue Sarcoma	0.43 (0.18 – 0.98)	0.05*
Histologic Grade		
1 (Low)	Ref	Ref
2 (Intermediate)	0.54 (0.20 – 1.45)	0.22
3 (High)	0.77 (0.31 – 1.94)	0.58
Anatomic Site		
Upper Extremity	Ref	Ref
Lower Extremity	2.02 (0.91 – 4.48)	0.08
Pelvis	1.25 (0.44 – 3.59)	0.68
Metastatic Disease		
No	Ref	Ref
Yes	1.25 (0.61 – 2.56)	0.55
Locally Recurrent Disease		
No	Ref	Ref
Yes	0.47 (0.21 – 1.05)	0.06
Surgery Characteristics		
Amputation	Ref	Ref
Limb Salvage	0.62 (0.50 – 3.91)	0.35
No Surgery	1.67 (0.20 – 14.37)	0.64
Chemotherapy Treatment		
No	Ref	Ref
Yes	0.89 (0.44 – 1.80)	0.75
Radiation Treatment		
No	Ref	Ref
Yes	0.80 (0.41 – 1.56)	0.51
Readmissions		
No readmissions	Ref	Ref
30-day readmission	0.72 (0.32 – 1.64)	0.43
90-day readmission	0.99 (0.47 – 2.06)	0.97
Hardware complication		
No	Ref	Ref
Yes	0.62 (0.20 – 1.90)	0.40

Figure 1: Geospatial Representation of Financial Toxicity
Legend: A visual representation of the average financial toxicity within each zip code for the three most represented states (NC, VA, SC) in the cohort. The orange diamond represents the institutional address. Darker colors indicate higher levels of financial toxicity.