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Scientific Article

Predictors of Financial Toxicity in Patients Receiving Concurrent Radiation Therapy and Chemotherapy

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Abstract

Purpose: Financial toxicity (FT) is a significant concern for patients with cancer. We reviewed prospectively collected data to explore associations with FT among patients undergoing concurrent, definitive chemoradiation therapy (CRT) within a diverse, urban, academic radiation oncology department.

Methods and Materials: Patients received CRT in 1 of 3 prospective trials. FT was evaluated before CRT (baseline) and then weekly using the European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire Core-30 questionnaire. Patients were classified as experiencing FT if they answered ≥2 on a Likert scale question (1-4 points) asking if they experienced FT. Rate of change of FT was calculated using linear regression; worsening FT was defined as increase ≥1 point per month. χ^2, *t* tests, and logistic regression were used to assess predictors of FT.

Results: Among 233 patients, patients attended an average of 9 outpatient and 4 radiology appointments over the 47 days between diagnosis and starting CRT. At baseline, 52% of patients reported experiencing FT. Advanced T stage (odds ratio, 2.47; $P = .002$) was associated with baseline FT in multivariate analysis. The mean rate of FT change was 0.23 Likert scale points per month. In total, 26% of patients demonstrated worsening FT during CRT. FT at baseline was not associated with worsening FT ($P = .98$). Hospitalization during treatment was associated with worsening FT (odds ratio, 2.30; $P = .019$) in multivariate analysis.

Conclusions: Most patients reported FT before CRT. These results suggest that FT should be assessed (and, potentially, addressed) before starting definitive treatment because it develops early in a patient's cancer journey. Reducing hospitalizations may mitigate worsening FT. Further research is warranted to design interventions to reduce FT and avoid hospitalizations.

Introduction

Financial toxicity (FT) refers to "out-of-pocket (OOP) expenses related to treatment akin to physical toxicity, which can diminish quality of life (QoL) and impede delivery of the highest quality care."[1] Costs include treatment expenses like copays, deductibles, and medications;

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transportation costs and childcare; and income loss by patients or caregivers.[2] One study has suggested that FT may be the single strongest predictor of poor QoL among patients with cancer.[3] Meta-analyses suggest that up to one-half of patients with cancer experience FT,[4,5] potentially leading to bankruptcy, poor treatment compliance, and possibly increased mortality.[6-9]

Providers are increasingly aware of patient FT, with 53% of radiation oncologists in one study being "very concerned" about FT; 52% said they would consider FT when making treatment decisions if equipoise exists. Despite these concerns, only 24% reported routinely screening for FT.[10] Many patients want to discuss costs with providers but rarely initiate such discussions.[11-13] In one study, only 19% of patients reported discussing costs with their oncologist.[14] Another found that among patients with breast cancer who wanted to discuss their cancer's effect on finances or employment, 55% never had such a discussion with a provider.[15]

Better understanding of FT may identify high-risk groups and develop interventions to mitigate FT and its effects. Previous studies suggest that patients who receive chemotherapy, have low income, or are members of minority groups have elevated FT risk.[16-18] Bronx, New York, is the poorest county in New York state, with 29% of residents living below the poverty line.[19] More than one-half of residents (~55%) speak a primary language other than English (mostly Spanish). More than 70% of patients seen at the research institution live in the Bronx. Thus, our institution serves many patients with low socioeconomic status (SES) and/or who belong to linguistic or ethnic minority groups, placing them at particular risk of FT. In this study, we evaluated factors related to FT among patients receiving curative-intent concurrent chemotherapy and radiation therapy (CRT) both before and during their CRT course.

Methods and Materials

Patient population

This is a retrospective review of prospectively collected data. Patients were enrolled between January 2015 and August 2018 at a single institution in 1 of 3 prospective trials involving continuous activity monitoring with wearable devices among patients with cancer receiving curative-intent, concurrent CRT.[20] All trials had similar inclusion criteria (Eastern Cooperative Oncology Group performance status of 0-2, able to ambulate independently without a cane or walker). Approval was obtained from the institutional review board.

Data collection

Patients completed serial QoL assessments, first at baseline (ie, before initiating CRT) then weekly during CRT using the European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire Core-30 (EORTC QLQ-C30), a widely used, validated QoL questionnaire that includes the question, "During the past week, has your physical condition or medical treatment caused you financial difficulties?"[21] Patients answer on a Likert scale with potential responses of 1 ("not at all"), 2 ("a little"), 3 ("quite a bit"), and 4 ("very much").

We obtained demographic data (eg, birth date, sex, racial/ethnic identity) using Clinical Looking Glass, interactive software developed at our institution to evaluate health care quality, effectiveness, and efficiency. Clinical Looking Glass also provided quantitative estimates for patients' SES based on home address, using neighborhood-level information including median household income, housing unit values, education level, and area occupation statistics (patient-reported data describing these factors are not available). The SES score is a continuous variable representing the patient's SES relative to the national mean. Other variables including cancer-related outpatient visits and radiologic tests were determined via manual review of patients' electronic medical record by 2 authors (J.J. and J.E.). Staging was performed according to the American Joint Committee on Cancer, seventh edition.

Statistical analysis

Outcomes of interest were baseline FT and worsening FT during CRT. Baseline FT was dichotomized between characterizing patients who responded "1, not at all" as not experiencing FT and those who responded "2, a little" or higher. This cut-off has been used previously,[9,22] because distinguishing between "a little" and "quite a bit" of FT (ie, between a Likert score of 2 and 3) is more subjective than distinguishing between "not at all" and "a little" (ie, between 1 and 2). We used linear regression to approximate a rate of FT change during CRT. Worsening FT was defined as a rate of change in FT of $\geq$1 point per 30 days. We are not aware of an established definition of the minimally important difference for EORTC QLQ-C30 question 28 to quantify FT. Therefore, we chose a cut off of $\geq$1 point per 30 days to identify individuals with a clear and consistent worsening of FT.

Patients were classified with "advanced T stage" if their tumor was stage T3 or T4 at diagnosis. Patients were considered to have met with a social worker (SW) if this occurred within 3 months of starting CRT. Patients self-reported their method of transportation (transportation service, taxi, car, subway) during weekly on-treatment visits. Patients were classified as using transportation services if they reported doing so on $\geq$1 visit.

Descriptive statistics using mean with standard deviation or median with interquartile range (IQR) were used to report baseline characteristics. χ^2, t, and Wilcoxon

paired sign rank tests were used to compare variables. Variables significant in univariate tests were tested in multivariate logistic regression models using stepwise backward regression. Final multivariate logistic models added basic demographic information. We also performed sensitivity analyses using a cut off of ≥0.5 point change per month as the definition for worsening FT. For all analyses, P values <.05 were considered statistically significant. Analyses were performed using Stata, version 16 (StataCorp, College Station, TX).

Results

Table 1 summarizes characteristics of the 233 included patients. Patients were primarily diagnosed with head and neck (32%), gastrointestinal (29%), and lung cancers (27%). In total, 34% identified as Black or African American and 38% as Hispanic. A total of 43 patients (20%) did not speak English, with 37 (86%) of non−English-speaking patients speaking Spanish. There was no statistical association between language spoken (ie, English vs other) and baseline FT (P = .80), worsening FT (P = .42), and seeing an SW (P = .87).

On average, patients completed EORTC QLQ-C30 a total of 5.4 times. At baseline, patients had attended a median of 9 cancer-related outpatient appointments (IQR, 7-11) and 4 radiology examinations (IQR, 2-5) over a median of 47 days from diagnosis to start of CRT, for median total of 13 pre-CRT visits (IQR, 10-16). Patients with lung cancer had more total visits than those with other primaries (14 vs 11, P < .001). Number of appointments was not associated with baseline FT (P = .317). Patients who received a diagnosis of cancer as an inpatient had fewer outpatient visits than those who received the diagnosis as an outpatient (7 vs 8, P = .002). Patients who received a diagnosis as an inpatient were more likely to have advanced T stage cancer (63% vs 37%, P = .001).

Baseline FT was assessed a median of 39 days after diagnosis. At baseline, 52% of patients reported any FT. Figure 1 shows the temporal change of FT scores. There was a significant increase in the within-person numerical FT scores at the end of treatment compared with their score at baseline (P < .001). During CRT, 27% of patients experienced worsening FT. Baseline FT was not associated with worsening FT during CRT (P = .98). Table 2 summarizes univariate predictors of baseline FT and worsening FT. On univariate analysis, significant predictors of baseline FT were meeting with SW before CRT (odds ratio [OR], 1.85; P = .022) or during CRT (OR, 1.88; P = .025); being diagnosed with cancer as an inpatient (OR, 1.85; P = .039); using a transportation service (OR, 1.85; P = .022); and stage T3/T4 cancer (OR, 1.40; P = .045).

One hundred forty-six (62%) patients met with the SW, either before (36% of patients) or during CRT (26% of patients). A total of 30% of patients who met with SW did not report either FT at baseline or worsening FT. Among 120 patients reporting baseline FT, 52 (43%) patients met with the SW before CRT, 32 (27%) met with the SW during treatment, and 36 (30%) never met with the SW. Such patients were more likely to meet with the SW before CRT than those without baseline FT (43% vs 29%, P = .025). Of 60 patients who experienced worsening FT during CRT, 21 (35%) patients met with the SW before CRT, 16 (27%) met with the SW during CRT, and 23 (38%) never met with the SW. Worsening FT was not associated with seeing the SW (P = .843).

Mean rate of FT change was 0.23 Likert scale points per month. In total, 26% of patients demonstrated worsening FT during CRT. Hospitalization during CRT was the only univariate predictor of worsening FT (OR, 1.95; P = .042). Multivariable analysis results are shown in Table 3. Advanced T stage (OR, 2.47; P = .002) was a significant predictor of FT at baseline (adjusting for age, sex, race, insurance, SES, and N stage). SW was not significant in the multivariate model (P = .060). Hospitalization during treatment was the only significant predictor (OR, 2.30; P = .019) of worsening FT (adjusting for age, sex, race, insurance, SES, and stage). Sensitivity analysis using a cut point of ≥0.5 point change per 30 days found similar results (OR for hospitalization during treatment, 2.42)

Discussion

In a prospective cohort from an urban, diverse patient population undergoing curative-intent CRT, approximately one-half of patients reported FT before beginning CRT. On average, patients attended 13 cancer-related appointments over 47 days before starting CRT. On multivariate analysis, advanced T stage was associated with experiencing baseline FT, and hospitalization during CRT was associated with worsening FT. To our knowledge, ours is the first study in adult patients with cancer to find that hospitalization is associated with worse FT and the first to report the number of cancer-related visits patients attended before starting CRT.

Although the number of cancer-related appointments did not correlate with baseline FT, we hypothesize that a threshold effect may exist such that patients begin to experience FT well before they present for CRT (ie, after only a few visits). Each visit invites copays, deductibles, medication, transportation costs, and potential reduced income for patients and/or caregivers. As well, once insurance deductibles are met, a greater proportion of future costs are born by the insurance company, potentially reducing additional direct financial effects. This finding suggests that our baseline FT assessment may have occurred too late to identify FT risk early. Average OOP costs spike immediately after diagnosis, averaging $1800 to $2900 in the subsequent month[23] and are greatest in the first months after

Table 1 Patient characteristics

	Baseline FT		Worsening FT		Total (N = 233)
	Yes (n = 120)	No (n = 113)	Yes (n = 60)	No (n = 173)	
Female	58 (49%)	51 (45%)	32 (53%)	77 (44%)	109 (47%)
Age, y	60 (11)	62 (11)	60 (11)	62 (11)	61 (11)
Racial/ethnic identification					
Non-Hispanic White	24 (20%)	23 (20%)	8 (13%)	39 (23%)	47 (20%)
Non-Hispanic Black	32 (27%)	34 (30%)	16 (27%)	50 (29%)	66 (28%)
Hispanic	35 (29%)	35 (31%)	19 (32%)	51 (29%)	70 (30%)
Other	4 (3%)	1 (1%)	2 (3%)	3 (2%)	5 (2%)
Declined to answer	25 (21%)	20 (18%)	15 (25%)	30 (17%)	45 (19%)
Insurance					
Private	42 (36%)	46 (41%)	23 (40%)	65 (38%)	88 (39%)
Medicaid	46 (39%)	33 (30%)	22 (39%)	57 (33%)	79 (35%)
Medicare	29 (25%)	32 (29%)	12 (21%)	49 (29%)	61 (27%)
ECOG performance status					
0	46 (39%)	48 (42%)	30 (51%)	64 (37%)	94 (41%)
1	59 (50%)	57 (50%)	26 (44%)	90 (53%)	116 (50%)
2	12 (10%)	8 (7%)	3 (5%)	17 (10%)	20 (9%)
Diagnosis					
Lung	31 (26%)	36 (32%)	16 (27%)	51 (30%)	67 (29%)
Head and neck	40 (34%)	29 (26%)	14 (24%)	55 (32%)	69 (30%)
Gastrointestinal	30 (25%)	37 (33%)	17 (29%)	50 (29%)	67 (29%)
Cervix	10 (8%)	10 (9%)	9 (15%)	11 (6%)	20 (9%)
Glioblastoma multiforme	7 (6%)	1 (1%)	3 (5%)	5 (3%)	8 (3%)
T stage					
0	2 (2%)	4 (4%)	0 (0%)	6 (4%)	6 (3%)
1	16 (15%)	24 (22%)	7 (13%)	33 (20%)	40 (18%)
2	32 (29%)	44 (40%)	23 (41%)	53 (32%)	76 (35%)
3	42 (38%)	24 (22%)	20 (36%)	46 (28%)	66 (30%)
4	18 (16%)	14 (13%)	6 (11%)	26 (16%)	32 (15%)
N stage					
0	23 (21%)	27 (25%)	14 (25%)	36 (22%)	50 (23%)
1	32 (29%)	25 (23%)	13 (23%)	44 (27%)	57 (26%)
2	43 (39%)	47 (43%)	26 (46%)	64 (39%)	90 (41%)
3	12 (11%)	11 (10%)	3 (5%)	20 (12%)	23 (10%)
AJCC 7th edition stage group					
1	4 (3%)	7 (6%)	3 (5%)	8 (5%)	11 (5%)
2	15 (13%)	22 (19%)	10 (17%)	27 (16%)	37 (16%)
3	61 (52%)	58 (51%)	26 (44%)	93 (54%)	119 (52%)
4	37 (32%)	26 (23%)	20 (34%)	43 (25%)	63 (27%)
Used transportation service	75 (64%)	54 (49%)	33 (60%)	96 (56%)	129 (57%)

(*continued on next page*)

Table 1 (*Continued*)

	Baseline FT		Worsening FT		Total (N = 233)
	Yes (n = 120)	No (n = 113)	Yes (n = 60)	No (n = 173)	
Number of hospitalizations during treatment					
0	61 (54%)	70 (67%)	27 (53%)	104 (62%)	131 (60%)
1	41 (36%)	28 (27%)	18 (35%)	51 (30%)	69 (32%)
2	7 (6%)	4 (4%)	2 (4%)	9 (5%)	11 (5%)
≥3	5 (4%)	3 (3%)	4 (8%)	4 (2%)	8 (4%)
Met with a social worker	81 (68%)	56 (50%)	34 (57%)	103 (60%)	137 (59%)
Number of imaging examinations before CRT	4 (2-5)	3 (2–5)	3 (3–5)	3.5 (2–5)	4 (2–5)
Number of outpatient appointments before CRT	8 (6–11)	8 (7–11)	8 (6–11)	8 (7–11)	9 (7–11)
Hospitalized before CRT	59 (49%)	43 (38%)	33 (55%)	69 (40%)	102 (44%)
Hospitalized before diagnosis	40 (33%)	24 (21%)	19 (32%)	45 (26%)	64 (27%)
Financial toxicity at baseline					
None			29 (48%)	84 (49%)	113 (49%)
A little bit			18 (30%)	44 (25%)	62 (27%)
Quite a bit			8 (13%)	18 (10%)	26 (11%)
Very much			5 (8%)	27 (16%)	32 (14%)

Abbreviations: AJCC = American Joint Committee on Cancer; CRT = chemotherapy and radiation therapy; ECOG = Eastern Cooperative Oncology Group.

diagnosis, suggesting that FT develops early in a patient's cancer journey.[23] Unsupportive work environments, more common among low-income workers, could exacerbate this problem. For example, the US Bureau of Labor Statistics reported that paid sick leave is available to only 21% of workers in the lowest income decile.[24] Resources such as dedicated financial counselors have been shown to help patients better understand their OOP costs and reduce financial difficulty scores.[25,26] Providing access to such resources as soon as possible after diagnosis could help address FT before it becomes a severe burden.

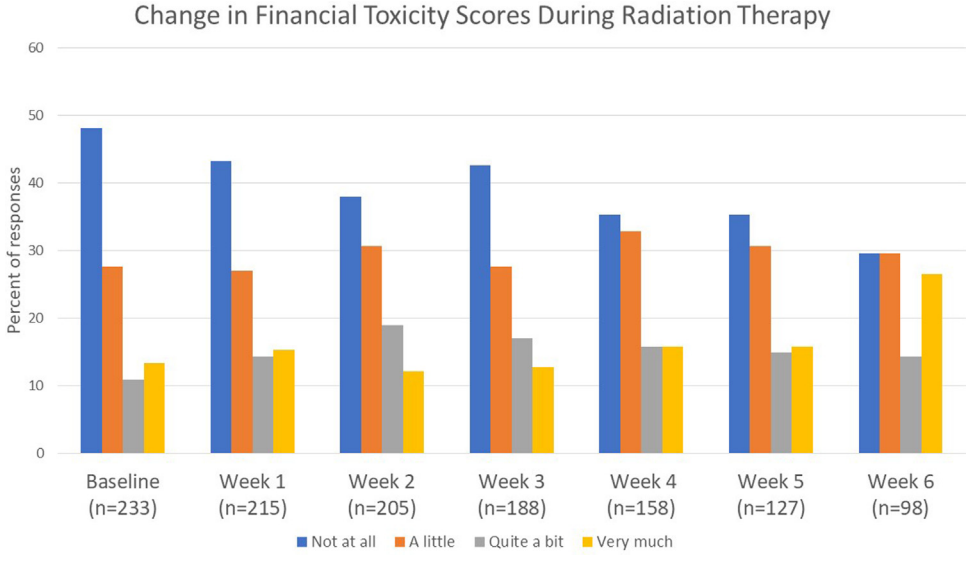

Figure 1 Change in distribution of financial toxicity scores over time. *Abbreviation:* n = number of questionnaires completed at each time point.

Table 2 Univariate predictors of financial toxicity

	Baseline		Worsening FT	
	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Met SW before RT	**1.88 (1.08-3.28)**	**.025**	0.91 (0.49–1.68)	.753
Met SW during RT	**1.88 (1.10–3.20)**	**.020**	0.95 (0.53–1.72)	.843
Met SW	**2.11 (1.24–3.60)**	**.005**	0.94 (0.53–1.67)	.122
Transportation service	**1.85 (1.09–3.15)**	**.022**	1.18 (0.64–2.16)	.592
Hospitalized before RT	1.57 (0.93–2.65)	.087	1.70 (0.96–3.01)	.068
Hospitalization leading to diagnosis	**1.85 (1.03–3.34)**	**.039**	1.26 (0.67–2.34)	.470
Hospitalized during CRT	1.61 (0.87–2.98)	.129	**1.95 (1.02–3.75)**	**.042**
T stage	**1.40 (1.07–1.83)**	**.045**	1.09 (8.15–1.46)	.840

Abbreviations: CI = confidence interval; CRT = chemotherapy and radiation therapy; FT = financial toxicity; OR = odds ratio; RT = radiation therapy; SW = social worker.

Table 3 Multivariate analysis

	OR (95% CI)	*P* value
Predicting baseline FT		
Age	0.98 (0.95–1.01)	.134
Female sex	1.41 (0.78–2.55)	.255
Black race	1.00 (0.53–1.90)	.999
Private insurance	0.77 (0.42–1.42)	.406
Socioeconomic status	1.04 (0.93–1.15)	.517
Advanced T stage	**2.47 (1.38–4.44)**	**.002**
Positive lymph nodes	1.30 (0.65–2.61)	.458
Predicting worsening FT		
Age	0.98 (0.95–1.01)	.217
Female sex	1.58 (0.81–3.07)	.177
Black race	1.09 (0.52–2.29)	.557
Private insurance	0.99 (0.50–1.97)	.974
Socioeconomic status	0.97 (0.86–1.09)	.580
Stage group	1.11 (0.50–2.44)	.803
Hospitalized during CRT	**2.30 (1.14–4.60)**	**.019**

Abbreviations: CI = confidence interval; CRT = chemotherapy and radiation therapy; FT = financial toxicity; OR = odds ratio.

Another common intervention for potential FT is referral to an SW, a trained professional skilled in identifying programs or techniques for reducing costs. Although baseline FT was correlated with likelihood of an SW referral, we found that only 36% of all patients, and only 43% of patients reporting FT at baseline, had been referred to the SW before starting CRT despite having already attended more than a dozen appointments on average. Of patients who met with the SW, 58% had this meeting after they had already begun treatment. As well, 30% of patients with FT at baseline never saw the SW at any point, suggesting that some patients with FT are not identified as needing assistance.

Patients who experience more severe FT may be more likely to ask for financial help and subsequently be referred to the SW, as seen in a previous study, where patients with greater subjective FT were more likely to contact a national copay assistance foundation.[2] However, we also found that meeting with the SW did not protect against worsening FT, suggesting that simply referring a patient to the SW may not sufficiently address FT. Again, this could be because FT has already developed and the patient sees SW too late. Another reason that seeing the SW may not protect against worsening FT is if FT was not raised as an issue by the patients (eg, if the SW visit was for help in obtaining transportation).

In our cohort, patients diagnosed while as an inpatient were more likely to have advanced cancer (advanced T stage). Patients at risk for FT may delay seeking diagnosis or care until hospitalization is required due to advanced disease. A previous study of commercially insured women undergoing screening mammography found that greater OOP costs were associated with lower adherence to screening guidelines.[27] Another study found that survivors of cancer with cancer-related FT were more likely to delay or forgo recommended care as a cost-saving measure.[28] Patients presenting with more advanced disease (eg, advanced T stage) or who are at high risk of hospitalization could be a target group for interventions to address FT, because these factors were associated with FT in our cohort. One previous study of parents of pediatric patients with cancer also correlated hospitalization with FT, as >5 unexpected hospitalizations in the first 5 years after diagnosis was associated with much greater financial burden (25 points on a 100-point scale) than those without unexpected hospitalizations.[29] To our knowledge, there are no such studies in adults.

However, it is not clear whether hospitalization causes worsening FT or vice versa. Several studies suggest that inpatient care causes significant OOP costs and FT. One found that hospitalization contributes to more than 40% of total OOP costs among Medicare beneficiaries with cancer who had the greatest OOP costs.[30] Another study suggested that patients with cancer missed 22 more workdays annually than patients without cancer,[31] which may be due, at least partly, to hospitalizations. A systematic review also has concluded that lost work days were associated with increased FT.[32] Alternately, increased FT could itself lead to hospitalization. In one survey, 27% of patients with cancer and FT reported medication nonadherence as a coping mechanism for FT.[14] To prevent repeat hospitalization, inpatients also may be prescribed more medications, adding costs to their financial burden and further worsening treatment compliance in a downward spiral. Inability to take prescribed medications may subsequently increase risk for hospitalization. In addition, patients with cancer are often older, with significant comorbidities. Adding costs of cancer care to existing treatment costs may increase the risk of nonadherence with treatment (cancer or noncancer). A Surveillance, Epidemiology, and End Results analysis found that in patients with cancer and preexisting coronary artery disease (CAD), those who were nonadherent with CAD medications were more likely to have a CAD-related hospitalization in the 12 months after their cancer diagnosis.[33]

We found that FT is independent of a patient's insurance status, suggesting that many patients may be underinsured or that insurance alone is insufficient to prevent FT. A recent prospective multicenter study of FT in patients with metastatic colon cancer also did not find an association between FT and insurance type.[34] Although 98% of their patients were insured, 71% still experienced major financial hardship. Income level and total assets < $100,000 were risk factors for FT regardless of insurance type, which likely mirrors the financial resources of cohort, given the demographics of our institution's catchment area. Another survey of patients with cancer from both academic and community hospitals found that despite 99% having insurance, patients still paid an average of $500 per month for cancer care,[35] a significant burden for low- (or even middle-income) patients.

Previous publications studying FT in patients receiving RT either did not collect data prospectively,[36] studied smaller cohorts,[9] were from countries with universal health care systems,[37] included patients not undergoing CRT,[38] or did not collect longitudinal FT data.[39] Therefore, our study is unique in its prospective, longitudinal data collection among a diverse population, all of whom received similar treatment (curative-intent CRT). The study population includes a significant proportion of patients with low SES and who belong to ethnic and/or linguistic minority groups, who are often underrepresented in clinical research populations[40] and may be at particular risk for FT. A strength of our institution is that many of the radiation oncology providers and SWs also speak Spanish, which may minimize language as a barrier to accessing care, including the SW. The diversity of our patient population may limit the generalizability of our results. Despite this, language may still serve as a barrier to accessing care, including the SW, and strategies to address this should be considered in future work. Another strength is that our results are less susceptible to the Hawthorne effect, because the primary purpose of the original studies was not to assess FT.

We also acknowledge some study limitations. First, this is a retrospective review of prospectively collected data from a single institution, possibly limiting the generalizability of our results. There is also a significant decrease in the number of patients who completed QoL questionnaires as treatment progressed, which may have biased data collection at later phases. Second, because the original purpose of these studies was to measure patient activity during CRT, patients who had poor performance status or who ambulate with assistance (eg, cane or walker) were not included. Third, we cannot determine a causal relationship between correlated variables and FT. Fourth, we evaluated FT based on a single question rather than a dedicated FT questionnaire such as the Comprehensive Score for Financial Toxicity,[41] which limits our ability to assess sources or details of patients' FT. Finally, our measure of FT does not specifically assess the psychological sequelae of FT, nor does it collect details on the lived experiences of FT among our patient population. To address these data gaps, our institution has an ongoing study qualitatively and quantitatively examining sources of stress (including financial). Despite these limitations, we believe that our study provides a valuable hypothesis-generation tool for developing interventions to address FT among patients with cancer from potentially marginalized groups.

Larger prospective studies are warranted using dedicated FT measurement tools (eg, Comprehensive Score for Financial Toxicity) to confirm hypotheses generated by this analysis and evaluate interventions to address FT. One possibility is to integrate an intake questionnaire into clinical workflow early in the journey of a patient with cancer to try to identify patients experiencing FT and initiate early financial discussions, which have been shown to decrease cost of care without changing cancer treatments.[42] Interventions to decrease hospitalizations could also improve FT, such as using data from wearable sensors in smartwatches, phones, and real-time monitoring apps to identify patients for early intervention.[43] Institutions could also consider cost effectiveness and favor less-expensive treatments with equal efficacy to more costly competitors. For example, after a *New York Times* editorial from Memorial Sloan Kettering Cancer Center

explained that they would not stock aflibercept because it was twice as expensive and yet equally effective as alternative drugs,[44] the manufacturer decreased the drug's price by 50%, demonstrating the power that institutions have to intervene on behalf of patients' financial wellbeing. Awareness of FT among hospital leadership also may help promote interventions to mitigate FT, decrease hospitalizations, and improve patient outcomes.

Conclusion

More than one-half of patients undergoing CRT reported FT before treatment. Despite this, most patients reporting FT did not meet with an SW before CRT. Patients attended a median of 13 cancer-related appointments over 6 weeks before beginning RT, which may contribute to the high proportion of patients reporting FT before CRT. Having advanced T stage cancer was associated with experiencing FT at baseline. Becoming hospitalized during treatment was associated with worsening FT during CRT. Concerns about FT should be considered before cancer treatment start and efforts to mitigate toxicity and prevent hospitalization may help prevent worsening FT.

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