

FREE ACCESS | Focus on Quality | May 27, 2014



# Impact of Financial Burden of Cancer on Survivors' Quality of Life

**Authors:** [Kathleen M. Fenn](#), [Suzanne B. Evans, MD, MPH](#), [Ruth McCorkle, PhD](#), [Michael P. DiGiovanna, MD, PhD](#), [Lajos Pusztai, MD, DPhil](#), [Tara Sanft, MD](#), [Erin W. Hofstatter, MD](#), ... [SHOW ALL](#) ..., and [Anees B. Chagpar, MD, MSc, MPH, MA, FRCS\(C\), FACS](#)

[AUTHORS INFO & AFFILIATIONS](#)

**Publication:** Journal of Oncology Practice • [Volume 10, Number 5](#) • <https://doi.org/10.1200/JOP.2013.001322>



## Abstract

### Purpose:

Little is known about the relationship between the financial burden of cancer and the physical and emotional health of cancer survivors. We examined the association between financial problems caused by cancer and reported quality of life in a population-based sample of patients with cancer.

### Methods:

Data from the 2010 National Health Interview Survey (NHIS) were analyzed. A multivariable regression model was used to examine the relationship between the degree to which cancer caused financial problems and the patients' reported quality of life.

### Results:

Of 2,108 patients who answered the survey question, “To what degree has cancer caused financial problems for you and your family?,” 8.6% reported “a lot,” whereas 69.6% reported “not at all.” Patients who reported “a lot” of financial problems as a result of cancer care costs were more likely to rate their physical health (18.6% v 4.3%,  $P < .001$ ), mental health (8.3% v 1.8%,  $P < .001$ ), and satisfaction with social activities and relationships (11.8% v 3.6%,  $P < .001$ ) as poor compared to those with no financial hardship. On multivariable analysis controlling for all of the significant covariates on bivariate analysis, the degree to which cancer caused financial problems was the strongest independent predictor of quality of life. Patients who reported that cancer caused “a lot” of financial problems were four times less likely to rate their quality of life as “excellent,” “very good,” or “good” (odds ratio = 0.24; 95% CI, 0.14 to 0.40;  $P < .001$ ).

### Conclusion:

Increased financial burden asa result of cancer care costs is the strongest independent predictor of poor quality of life among cancer survivors.



## Introduction

For a patient who receives a diagnosis of cancer, the financial impact of this diagnosis can be significant. The

To ensure the optimal website experience, ASCO utilizes permanent cookies and web beacons/pixel tags for a multitude of purposes, including site functionality, display of personalized and recommended content, and the collection of analytics to help improve how our customers engage with us. Clicking “Accept All” allows you to access all features of this website. For more information, see our [Privacy Policy](#) and [Terms of Use](#).

### Cookies Settings

Reject All

Accept All

may experience loss of productivity at work or total loss of employment and work-related benefits.<sup>[2,3](#)</sup>

Household finances may suffer if the patient's family members take time away from work to help with their care.<sup>[4](#)</sup> Other less apparent causes of financial burden include child care, domestic help, medical equipment, special foods, and nutritional supplements.<sup>[1](#)</sup>

A high proportion of patients are affected economically by a cancer diagnosis. The SUPPORT (Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment) study found that approximately one third of families of seriously ill patients reported losing most or all of their family's savings.<sup>[5](#)</sup> There is evidence to suggest that patients who are economically affected by cancer are more likely to delay further medical treatment and avoid filling prescriptions, thus putting their physical health in jeopardy.<sup>[6,7](#)</sup>

Among American patients with cancer, the degree of financial burden resulting from cancer care costs can be variable. Low-income patients have been shown to have disproportionately high expenses as a result cancer.<sup>[8](#)</sup> Insurance coverage and cancer type can also affect an individual's cancer-related economic burden.<sup>[9](#)</sup> Depending on an individual's particular financial and personal circumstances, the economic toll of cancer can be profound.

The psychosocial effects of cancer-related financial strain are understudied, and the degree to which cancer-related monetary costs affect an individual's overall quality of life has not been fully elucidated. Several studies have recently emerged reporting an association between increased economic burden resulting from cancer and decreased quality of life.<sup>[10,11](#)</sup> We sought to characterize the relationship between cancer-related financial problems and self-reported quality of life through analysis of data from a nationwide, population-based study.

## Methods

Data from the 2010 National Health Interview Survey (NHIS) were analyzed. The NHIS is the largest source of health information of US households, designed to reflect the nation's civilian noninstitutionalized population. It is a cross-sectional interview study administered annually by the National Center for Health Statistics, Centers for Disease Control and Prevention. The NHIS uses a multistage sample design involving stratification and clustering techniques, and is designed to oversample Black, Hispanic, and Asian persons. The survey is administered face-to face by one of approximately 400 trained surveyors using computer-assisted personal interviewing, in which survey administrators enter data directly into a laptop computer at the time of interview.

The core of the survey contains four different segments: Household, Family, Sample Adult, and Sample Child. The Household segment collects demographic information on all members of the household from a single representative. The Family segment verifies and collects additional demographic information about individual members of the household. A sample adult and sample child (if applicable) are randomly chosen from each household, and questionnaires are administered to collect additional information on health status, health service use, and health behaviors. Supplements to the survey are administered to address specific public health questions. The Cancer Control Supplement (CCS) collects information on cancer-related health behaviors and cancer screening. In years when the CCS is administered, it is given to the sample adult in each selected household. The CCS was last administered in 2010. Further data on the NHIS are available

burden caused by cancer using a 4-point scale. Possible responses were “a lot,” “some,” “a little,” “not at all,” “don't know,” and “refused.”

We analyzed the resulting data. Bivariate analyses were performed to examine whether the respondents who refused to answer or answered “don't know” to this question had statistically significant differences in their responses to other survey items examined in this study. Those who answered the question informatively then formed the cohort of interest for our analyses.

The degree to which cancer caused financial problems was then evaluated in terms of its correlation with sociodemographic covariates, including sex, age, race/ethnicity, highest level of education completed, insurance status, family income, region of residence, and cancer type, along with respondents' rating of their perceived quality of life. In particular, respondents were asked to rate their quality of life in general, their physical health, their mental health, and their satisfaction with social activities and relationships. Possible responses included “excellent,” “very good,” “good,” “fair,” and “poor.” Furthermore, we evaluated respondents' perceived risk of recurrence (“What do you think the chances that your cancer will come back or get worse within the next 10 years?”), and their worry regarding the same (“How often do you worry that your cancer may come back or get worse?”).

A binary logistic regression model was created to determine the independent effect of cancer-related financial problems on quality of life, controlling for all of the sociodemographic factors found to be significant at  $P < .1$  on bivariate analysis. All statistical analyses were performed with SUDAAN software (Release 9.0.1, Research Triangle Park, NC).

## Results

For the 2010 administration of the NHIS, the final response rate for the Sample Adult was 60.8%.<sup>12</sup> Among the 2,151 adult cancer survivors surveyed (representing 17,873,413 people in the population), 98.0% answered the question regarding the degree to which cancer caused them and their family financial problems. Among all people who were asked the question, 1.5% reported that they “didn't know” how cancer had financially affected them or declined to answer. When informative responders were compared with those who responded “don't know” or declined to answer, no statistically significant differences were seen in terms of sociodemographic factors, suggesting that there was unlikely to be a systematic reporting bias in those who responded to the question of how cancer affected their financial life (Appendix [Table A1](#), online only). Those who refused to answer or did not know how cancer affected their financial status did, however, had a significantly lower rate of worrying about their cancer coming back than those who provided informative answers (0% v 9.6%;  $P = .005$ ).

Of those who provided informative responses, 8.6% reported “a lot” of cancer-related financial problems, 11.7% reported “some,” 10.3% “a little,” and 69.6% “not at all.” Patients who reported “a lot” of financial problems were more likely to be female ( $P = .016$ ), under the age of 61 ( $P < .001$ ), of non-white race ( $P < .001$ ), with less than a 4-year college education ( $P = .002$ ), and a total combined household income of less than \$35,000 ( $P < .001$ ; [Table 1](#)). Subjects who reported “a lot” of cancer-related financial problems were also less likely to report Medicare as their primary health insurer ( $P < .001$ ). The three types of cancer with the largest proportion of

Table 1. Degree to Which Cancer Caused Financial Problems, by Demographic Characteristics					
Characteristic	Degree of Cancer-Related Financial Problems				P
	A Lot (%)	Some (%)	A Little (%)	Not at All (%)	
% total sample	8.6	11.7	10.3	69.6	
Sex					.016
Male	7.2	10.8	12.5	69.6	
Female	9.8	12.3	8.5	69.5	
Race/ethnicity					< .001
<div> EXPAND TABLE </div>					

Bivariate analyses were then performed to examine the association between degree of cancer-related financial problems and subjective evaluation of quality of life ([Table 2](#)). Compared with patients who answered “not at all,” patients who reported “a lot” of cancer-related financial problems were more likely to report “poor” quality of life ( $P < .001$ ). This was true for self-assessment of general quality of life, as well as respondents' rating of their physical health, mental health, and social life. In addition, patients who reported “a lot” of cancer-related financial problems were more likely to believe the chances of their cancer returning to be high and to report a higher frequency of worry about their cancer returning in the future ( $P < .001$ ).

Table 2. Bivariate Analysis of Degree to Which Cancer Caused Financial Problems, by Quality-of-Life Ratings					
Variable	Degree of Cancer-Related Financial Problems				P
	A Lot (%)	Some (%)	A Little (%)	Not at All (%)	
Rating of general quality of life					< .001
Excellent	3.7	9.7	8.9	77.8	
Very good	9.7	10.6	9.7	74.9	
Good	11.6	13.9	11.8	62.8	
<div> EXPAND TABLE </div>					

On multivariable analysis, self-reported quality of life of “good,” “very good,” or “excellent” was inversely correlated with the degree to which cancer caused financial problems, independent of all sociodemographic variables found to be significant on bivariate analyses ([Table 3](#)). Patients with “a lot” of cancer-related financial problems carried a four-fold decrease in likelihood of reporting a quality of life of “good” or better (odds ratio = 0.24; 95% CI, 0.14 to 0.40;  $P < .001$ ). Age, education, insurance status, and total combined family income were also significant independent predictors of quality of life.

<p>Table 3. Multivariable Analysis: Quality of Life of at Least “Good,” by Degree to Which Cancer Caused Financial Problems and Demographic Characteristics</p>
---

Variable	Adjusted OR	95% CI	P
A little	0.67	0.41 to 1.08	.101
Not at all		Referent	

EXPAND TABLE

Abbreviation: OR, odds ratio.

## Discussion

We analyzed results of a nationwide health interview study and found that the degree of cancer-related financial problems was the strongest independent predictor of quality of life among a population of cancer survivors over the age of 18. Patients who reported “a lot” of financial problems were approximately four times less likely to report a quality of life that was “good” or better (odds ratio = 0.24; 95% CI, 0.14 to 0.40) compared with patients who reported no financial problems. The magnitude of cancer-related financial difficulty was a more significant predictor of quality of life than age, education, race/ethnicity, and family income. These findings highlight the potentially powerful impact of financial strain on a patient's perception of their overall well-being after a cancer diagnosis.

Like others, we found that increased cancer-related financial hardship is associated with lower household income,<sup>13,14</sup> female sex,<sup>15</sup> and younger age.<sup>7,13,14</sup> Several factors can be identified to help explain the sex disparity. In comparison with men, terminally ill women have been found to be less likely to receive caregiving assistance from family and friends and thus more likely to have to pay for nursing care.<sup>15</sup> In addition, women may be disproportionately affected by childcare expenses, potentially contributing to increased financial burden after cancer diagnosis. Age was another significant predictor of financial burden. Both Medicare coverage and age over 65 years were associated with fewer cancer-related financial problems. Americans over 65 benefit from Medicare coverage, and are thus less likely than younger patients to be uninsured or underinsured, leading to increased financial protection from medical diagnoses that require expensive treatment. Furthermore, older patients are more likely to have accrued financial resources and are less likely to have younger dependents.

Several studies have reported that financial difficulties and low income are associated with anxiety and depression in cancer survivors.<sup>16–19</sup> However, few have examined the relationship between cancer-specific financial problems and quality of life. Using survey data from patients on a cancer registry in Ireland, Sharp et al<sup>11</sup> found that cancer-related financial strain was associated with a roughly three-fold risk for depression. Similarly, among a group of breast cancer survivors from the southeastern United States, Meneses et al<sup>10</sup> reported an association between cancer-related financial events, such as decrease in work productivity and additional incurred out of pocket expenses, with decreased quality of life. A major strength of our study is the use of data designed to be representative of the entire US population, thus limiting population biases that may be present in institution-based or regional studies.

Compared with some prior studies, we noted a relatively low proportion of patients who reported financial problems as a result of cancer. The majority of patients in our study (69.6%) claimed no financial problems at all, whereas much smaller proportions reported “a lot” (8.6%) or “some” (11.7%). Reported levels of cancer-



reported at least some degree of financial burden from cancer-related expenses; for 27%, this burden was significant or catastrophic. Aspects of our study population may explain the lower reported rates of financial strain. The survey captured responses from patients who reported a diagnosis of cancer ever in their lifetime. Recall bias is likely to be present: patients for whom much time has elapsed since cancer diagnosis and treatment may be less likely to recall financial hardship, especially if they have reaccumulated resources lost during that time. It is also possible that the survey population included some patients who were diagnosed with childhood cancer and were thus, to a degree, protected from the financial toll of their disease.

Our study has several limitations. The survey item on cancer-related financial problems assessed a subjective rating of financial burden. There may have been significant variation in patients' interpretation of the potential responses (eg, “a lot” v “some”). Similarly, quality of life was also measured by self-assessment, potentially leading to greater variation in response in comparison to results obtained from validated quality-of-life instruments. Because the NHIS is a cross-sectional study, no conclusions about causation can be drawn. In addition, the survey does not provide any data on cancer stage and prognosis. Patients with more advanced disease may be more likely to have increased worry, lower quality of life, and increased financial difficulties; we are unable to examine this relationship with the available survey data. Furthermore, the survey included any patients who had ever been told they had cancer, and no temporal relationship between cancer diagnosis and emergence of financial difficulty can thus be elucidated from the data. This temporal relationship is also likely to confound data on quality of life and degree of worry that cancer may return; for example, patients for whom more time has elapsed since a cancer diagnosis may be less likely to worry about recurrence. Finally, our data do not report on the sources of financial difficulties for patients with cancer, which could inform the types of interventions necessary to address this problem.

However, this study is, to our knowledge, the largest, most contemporary population-based analysis of the financial impact of cancer on the self-reported quality of life of Americans. Our data highlight the need to draw increased attention to the economic burden caused by a cancer diagnosis and the impact this burden may have on a patient's overall well-being. Lack of insurance coverage is strongly associated with the degree of cancer-related financial problems. Additional interventions to decrease personal costs of cancer are worthy of further study. Cost-effectiveness research to meticulously appraise the cost versus benefit of cancer therapies is needed, along with an increasing awareness on the part of clinicians of the impact cancer-related costs can have on the quality of life of their patients.

## Acknowledgment

Previously presented at the Southwestern Surgical Congress, Santa Barbara, CA, March 27, 2013.

## Publisher's Note

The article by Fenn, et al, entitled, "Impact of Financial Burden of Cancer on Survivors' Quality of Life" (J Oncol Pract 10.1200/JOP.2013.001322), was published online May 27, 2014 with errors.

In the author affiliations, the location for Yale School of Medicine and Yale School of Nursing was given as Boston, MA, whereas it should have been New Haven, CT.

The authors indicated no potential conflicts of interest.

References

1.

J Brooks, K Wilson, Z Amir: Additional financial costs borne by cancer patients: A narrative review *Eur J Oncol Nurs* 15: 302– 310,2011

+ Show Citations

[Crossref](#)

[PubMed](#)

[Google Scholar](#)

2.

CJ Bradley, D Neumark, Z Luo, etal: Employment and cancer: Findings from a longitudinal study of breast and prostate cancer survivors *Cancer Invest* 25: 47– 54,2007

↵ Go to Citation

[Crossref](#)

[PubMed](#)

[Google Scholar](#)

3.

L Gordon, P Scuffham, S Hayes, etal: Exploring the economic impact of breast cancers during the 18 months following diagnosis *Psychooncology* 16: 1130– 1139,2007

↵ Go to Citation

[Crossref](#)

[PubMed](#)

[Google Scholar](#)

4.

A Timmons, R Gooberman-Hill, L Sharp: The multidimensional nature of the financial and economic burden of a cancer diagnosis on patients and their families: Qualitative findings from a country with a mixed public-private healthcare system *Support Care Cancer* 21: 107– 117,2013

↵ Go to Citation

[Crossref](#)

[PubMed](#)

[Google Scholar](#)

SHOW ALL REFERENCES

Appendix

Table A1. Demographic Characteristics of Informative Responders Versus Those Who Refused to Answer or Responded “Don't Know”			
Characteristic	Informative Responders (%)	“Don't Know” or Refused to Respond (%)	<i>P</i>
% total sample	98.5	1.5	
Sex			.219
Male	44.0	39.3	
Female	56.0	60.6	
Race/ethnicity			.450
White	90.6	90.4	
EXPAND TABLE			

ADVERTISEMENT

To ensure the optimal website experience, ASCO utilizes permanent cookies and web beacons/pixel tags for a multitude of purposes, including site functionality, display of personalized and recommended content, and the collection of analytics to help improve how our customers engage with us. Clicking “Accept All” allows you to access all features of this website. For more information, see our [Privacy Policy](#) and [Terms of Use](#).

Cookies Settings

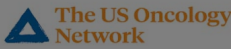
Reject All

Accept All

# ASCO® Career Center

## Gynecologic Oncologist - Texas Oncology Fort Worth Fort Worth, TX | Comprehensive

Overview Texas Oncology is looking to add an additional BC/BE Gynecologic Oncologist to its busy group in Fort Worth, TX. This physician will be jo...  
Employer: The US Oncology Network [Apply for this job](#)



## Breast Surgeon - Texas Oncology Houston West Tomball, TX | Comprehensive

Overview Texas Oncology is seeking a BC/BE fellowship trained Breast Surgeon for the west Houston area. This is a unique professional opportunity t...  
Employer: The US Oncology Network [Apply for this job](#)



## GI Oncologist - JTCC Hackensack Hackensack, NJ | Comprehensive

Overview The John Theurer Cancer Center (JTCC) in Hackensack, NJ is looking for a graduating medical oncology fellow or junior faculty member to jo...



ADVERTISEMENT

[View full text](#) | [Download PDF](#)



- JOURNALS**  
[Journal of Clinical Oncology](#)  
[JCO Oncology Practice](#)  
[JCO Global Oncology](#)  
[JCO Clinical Cancer Informatics](#)  
[JCO Precision Oncology](#)
- PUBLICATIONS**  
[ASCO Educational Book](#)  
[ASCO Daily News](#)  
[ASCO Connection](#)  
[The ASCO Post](#)  
[ASCO Podcasts](#)
- CONTENT**  
[Journal Podcasts](#)  
[Topics](#)  
[Meeting Abstracts](#)  
[ASCO Guidelines](#)
- INFORMATION**  
[Author Center](#)  
[Subscriber Center](#)  
[Permissions](#)  
[Reprints](#)  
[Advertising](#)
- FOLLOW US**  
[JCO\\_ASCO](#)  
[JCOOP\\_ASCO](#)  
[JCOGO\\_ASCO](#)  
[JCOPO\\_ASCO](#)  
[JCOOCL\\_ASCO](#)

To ensure the optimal website experience, ASCO utilizes permanent cookies and web beacons/pixel tags for a multitude of purposes, including site functionality, display of personalized and recommended content, and the collection of analytics to help improve how our customers engage with us. Clicking “Accept All” allows you to access all features of this website. For more information, see our [Privacy Policy](#) and [Terms of Use](#).

### Cookies Settings

Reject All

Accept All



To ensure the optimal website experience, ASCO utilizes permanent cookies and web beacons/pixel tags for a multitude of purposes, including site functionality, display of personalized and recommended content, and the collection of analytics to help improve how our customers engage with us. Clicking “Accept All” allows you to access all features of this website. For more information, see our [Privacy Policy](#) and [Terms of Use](#).

**Cookies Settings**

Reject All

Accept All