Original Contribution

Cost Concerns of Patients With Cancer

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Abstract

Purpose: Health care providers are accustomed to identifying populations for whom cost-related concerns may be a significant barrier, such as the poor, but few empiric data have been collected to substantiate such assumptions, particularly among insured patients.

Methods: Patients with cancer from academic and community hospitals completed a questionnaire that included closed-ended items concerning demographic variables, optimism, numeracy, and concerns about present and future medical costs. In addition, they answered open-ended questions regarding cost concerns and medical expenses.

Results: Nearly all (99%) participants were insured. In response to the closed-ended questions, 30.3% of patients reported concern about paying for their cancer treatment, 22.3% reported that their family had made sacrifices to pay for their care, and 8.3% stated that their insurance adequately covered their current health care costs, and 17.3% reported concerns about coverage for their costs in the future. On open-ended questions, 35.3% reported additional expenses, and 47.5% reported concerns about health care costs. None of the assessed patient characteristics proved to be a robust predictor across all cost-related concerns. There was a strong association between the identification of concerns or expenses on the open-ended questions and concerns on closed-ended questions.

Conclusion: Cost concerns are common among patients with cancer who have health insurance. Health care providers may alleviate concerns by discussing cost-related concerns with all patients, not only those of lower socioeconomic status or those without insurance. A closed-ended screening question may help to initiate these conversations. This may identify potential resources, lower distress, and enable patients to make optimal treatment decisions.

Introduction

Given the rising costs of cancer care, treatment-related costs may be a major factor in decision making for patients, even those who have health insurance. ASCO encourages physicians to discuss the cost of care with their patients.[1] However, there is relatively little guidance for clinicians as to the best way to approach these discussions, and with whom they should occur.[2] An adaption of the SPIKES framework, which was developed for communicating bad news,[3] recommends the use of a screening question ("Do you have financial concerns?") and that clinicians include financial concerns as part of a patient intake/assessment form meant to guide conversation with the physician.[4] Additional research regarding factors associated with patients' concerns about financial costs may further improve communication and shared decision making. Such research may be especially helpful in identifying cost-related concerns and "hidden costs" (eg, transportation) among insured patients, as this population's financial burden may be less obvious and more difficult to quantify.[5]

There are relatively few empiric data that characterize the extent of patients' concerns about costs and what factors may be associated with these concerns. Lower socioeconomic status (SES) has been linked to worse outcomes,[6] which may at times relate to decisions to forego costly treatments. Thus, it is possible that lower SES is also associated with greater concerns. However, other patient factors may also affect concern about costs. For example, low numeracy has been associated with difficulty in making optimal treatment choices.[4] Low-numerate individuals might be unable to interpret information such as copayments and deductibles, which may lead to increased anxiety about cost.[7] Also, greater dispositional optimism (ie, generalized positive expectancies for one's future) may decrease cost concerns. Optimistic individuals are more likely to adopt a "fighting spirit" coping response, the position of confronting and trying to "beat" cancer.[8] As such, they may be more concerned with the possible positive outcome of treatment than with the cost incurred. Understanding how certain patient characteristics (eg, SES, numeracy, and optimism) relate to cost concerns may allow health care providers to appropriately tailor cost-related communication.

This study investigated factors associated with concerns about costs in a predominantly insured population in order to make recommendations for patient communication. We hypothesized that higher SES, numeracy, and optimism would decrease patients' concerns about health care costs. In addition, we gathered qualitative data on what types of cost concerns patients have (eg, uncertainty about future costs) and what expenses they have incurred.

Methods

Study Populations

This analysis is part of a cross-sectional study investigating how patients make trade-offs when choosing among treatments of varying efficacy, toxicity, and cost.[8a] Study participants were patients with cancer, of any stage and diagnosis, whose cancer had been diagnosed at least 60 days before initiation of the study. Inclusion criteria were: 18 years of age or older and (for those with metastatic cancer) a performance status of 0 to1 (asymptomatic or minimally symptomatic) as assessed by their treating medical oncologist. Physician consent was obtained before patient contact. Each participant provided written consent to participate. The study and instruments were approved by the institutional review boards at each participating study site (Fox Chase Cancer Center and South Jersey Hospital).

Recruitment

Patients were recruited by means of a novel method of active and passive consent designed for this study. Eligible patients were identified from a review of medical records. They were sent a letter by mail inviting them to participate in the study. In addition, they received a card to mail back to indicate (1) interest in participating in the study (active consent) (2) lack of interest in the study (active decline), and (3) interest in receiving more information about the study. The patients received a $20 gift card at study completion. In total, 584 patients were contacted across both sites. Patients were recruited between January 5, 2010, and September 1, 2011.

Measures

Demographics. Patients were asked about their age, race, sex, marital status, educational level, home ownership status and annual household income.

Cancer history and treatment. The patients were asked about their primary site of cancer, whether it had metastasized, and their year of diagnosis. They were also asked what prior treatment (surgery, radiation, chemotherapy, hormonal therapy) they had received.

Numeracy. The eight-item Subjective Numeracy Scale described by Fischer[9,10] was used to assess numeracy. This measure contains four items that measure beliefs about skill in performing various mathematical operations, such as, "How good are you at figuring out how much a shirt will cost if it is 25% off?" It also contains four items that measure preferences regarding the presentation of numerical information, such as, "When you hear a weather forecast, do you prefer predictions using percentages (eg, 'there will be a 20% chance of rain today') or predictions using only words (eg, 'there is a small chance of rain today')?"

Dispositional optimism. The Life Orientation Test–Revised[11] was used to assess optimism. This 10-item scale uses a 5-point Likert scale to assess patients responses to items such as, "If something can go wrong for me, it will." In this scale, higher scores indicate greater optimism.

Concerns about treatment costs and sacrifices. The patients were asked four questions about their concerns about present and future health care costs: "My current insurance coverage adequately covers my health care costs," "I am confident that my insurance will cover my health care costs in the future," "I have concerns about paying for my cancer treatment," and "My family has made financial sacrifices to pay for my medical care." Patients responded using a 5-point Likert scale ranging from "I agree a lot" to "I disagree a lot."

Two open-ended questions were asked concerning costs: "Do you have any concerns about the cost of cancer treatments—for yourself and your family, or other people?" and "Other than any costs associated with your medical treatment have you or your family had other costs as a result of your cancer diagnosis (eg, travel expenses, medical care, or counseling for family members)?" Responses to these questions were content coded using a coding key developed for this study, and the responses were separately reviewed and rated by two investigators. Inter-rater reliability was acceptable, ranging from 89.5% to 100% between each rating category. The concerns were identified as "affordability of medical costs," "low insurance coverage," "uncertainty about future costs," "copayments/out-of-pocket costs," "cost of health insurance," and "making trade-offs." Patients who answered "yes," but did not list a specific concern were marked as "unspecified concern." Responses that did not fit the coding scheme were also categorized as "unspecified concern." Patients who did not respond to the question were categorized as "missing." Patients who identified at least one specific concern or an unspecified concern were included in an "any concern" category.

Expenses were identified as travel, lost income, counseling, or other medical costs. Patients who answered "yes" but did not list a specific concern were marked as "unspecified expenses." Responses that did not fit the coding scheme were also categorized as unspecified expenses. Patients who did not respond to the question were categorized as missing. Patients who identified at least one specific expense or an unspecified expense were included in an "any expense" category.

Statistical Analyses

Categorical variables were tabulated, and means were calculated for continuous variables. To determine factors related to a patient's concerns about cancer treatment, we built univariate ordinal logistic regression models with the responses to the concerns about treatment costs and sacrifices questions as the outcomes of interest.[12] Demographic variables (age, race, sex, marital status, educational level, home ownership status, and annual household income), numeracy, and optimism were the independent variables. Responses to all four concerns and sacrifices items were recoded into three categories, in which the highest category corresponded to having concerns and/or making sacrifices. For example, for the statement, "My family has made financial sacrifices to pay for my cancer care," "agree a lot"

or "agree a little" were placed in the highest category. "Neither agree nor disagree" was placed in the middle category, and "disagree a little" or "disagree a lot" were placed in the lowest category. Conversely, for the statement, "I am confident that my insurance will cover my health care costs in the future," coding was reversed, with "disagree a little" or disagree a lot" being placed in the highest category. For ease of presentation, all predictors that were at least marginally significant of the four questions ($P < .10$) were entered into a multivariable model that was used for all of the four questions.

We then sought to determine whether the closed-ended questions were predictive of expressing more detailed cost concerns. To measure the association between the responses to the closed-ended cost concern questions and open-ended questions, we built similar ordinal logistic regression models with "any concern" or "any expense" as the independent variables. These analyses were performed using STATA 12.0 (StataCorp, College Station, TX)

Results

Four hundred patients completed the study. Patient characteristics and responses to cost concerns questions are shown in Table 1. The median age was 61 years (range, 27 to 90), A majority of participants were female (62.5%) and white (86.3%). Forty-one percent (40.8%) had at least a college education, 44.3% reported having an annual income of less than $60,000, and 25.0% received care at a community hospital. Almost all (99.0%) had insurance coverage. Eight percent (8.3%) disagreed "a lot" or "a little" with the statement, "My insurance coverage adequately covers my health care costs," and 17.3% disagreed "a lot" or "a little" with the statement, "I am confident that my insurance will cover my health care costs in the future." Thirty percent (30.3%) agreed "a lot" or "a little" with the statement, "I have concerns paying for my cancer treatment, and 22.3% responded that they agreed "a lot" or "a little" with the statement, "My family has made financial sacrifices to pay for my cancer care."

Association Between Patient Characteristics and Closed-Ended Cost Concerns

On univariate ordinal regression analysis,[8] several patient characteristics (younger age, low income, being employed, having less than a 4-year college degree, being single, low numeracy, and low optimism) were associated with greater concerns. However, these associations varied among the four questions, as shown in Appendix Table A1 (online only). On multivariable analysis, certain characteristics remained predictive of specific concerns (Appendix Table A2, online only). For example, unmarried and less optimistic patients were more likely to disagree with the statement, "My current insurance adequately covers my health care costs." Older patients were more likely to agree with the statement, "My family has made financial sacrifices to pay for my medical care." To summarize, although several patient characteristics predicted concerns, these characteristics differed depending on which of the four questions served as the outcome variable. No one patient characteristic proved to be a robust predictor of concerns and sacrifices.

Analysis of Qualitative Data

Table 2 summarizes the responses to the cost-related concerns and additional expenses identified by patients. Examples of these concerns and expenses expressed by patients are shown. Almost half (47.5%) of patients reported concern about costs. More than one third (35.3%) of patients reported additional expenses (such as lost wages). The most commonly mentioned additional expense was travel (22.3%).

Relationship Between Quantitatively Assessed Cost Concerns and Qualitative Data From Open-Ended Questions

Identifying any cost concern on the open-ended question was associated with greater concerns in all four of the closed-ended questions. With the exception of the question, "I am confident that my insurance will cover my health care costs in the future," identification of any additional expenses was also associated with greater concerns in the closed-ended questions. These associations are shown in Table 3.

Discussion

In this cross-sectional study of insured patients with cancer, we noted a relatively high prevalence of present and future cost concerns among patients treated at both academic and community hospitals. However, these cost concerns were not associated with sociodemographic factors such as income or education, or clinical factors such as hospital site or presence of metastatic disease. In addition, cost concerns were not consistently associated with patient characteristics such as optimism or numeracy. Our qualitative analyses indicate that patients have a wide range of cost concerns and additional expenses. Identification of specific concerns and expenses on the qualitative section was strongly associated with greater cost concerns in the closed-ended questions.

These findings are significant because they demonstrate that cost concerns may affect a more heterogeneous group of patients than we had hypothesized. Health care providers may be accustomed to identifying vulnerable populations for whom cost-related concerns may be a significant barrier to care, such as the poor or underinsured. However, our results indicate that cost concerns may extend beyond the groups that are traditionally considered vulnerable. For example, 27% of the patients who were treated at the academic center reported travel costs as an additional expense, likely because many patients receiving care at a tertiary care center travel farther from home than those cared for in a community site. Given both the economic uncertainty many patients face and the increasing costs of cancer treatment, it may be helpful for health care providers to discuss concerns with all patients, rather than relying on demographic characteristics to determine with whom costs should be discussed.

Table 1. Patient Characteristics

Characteristic	No.	%
Total No. of patients	400	
Sex		
Male	149	37.25
Female	250	62.5
Missing	1	0.25
Age, years		
Mean	61.1	
Range	27-90	
Race/ethnicity		
White	345	86.25
Other	55	13.75
Marital status		
Married/partnered	268	67
Other	131	32.75
Missing	1	0.25
Level of education		
Less than college degree	236	59
College degree and greater	163	40.75
Missing	1	0.25
Employment status		
Full-time	144	36
Part-time	36	9
Homemaker	13	3.25
Retired	165	41.25
Unemployed > 1 year	30	7.5
Unemployed < 1 year	11	2.75
Annual household income, $		
< 60,000	177	44.25
> 60,000	184	46
Missing	39	9.75
Primary site		
Breast	140	35
Prostate/genitourinary	66	16.5
GI	41	10.25
Lung/head and neck	27	6.75
Blood	27	6.75
Gynecologic	12	3
Skin	12	3
Other	73	18.25
Missing	2	0.5
Known metastatic disease		
Yes	108	27
No	266	66.5
Don't know/missing	26	6.5
Diagnosis year		
1999 and before	52	13
2000-2005	114	28.5
2006-2010	201	50.25
Missing	33	8.25

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Table 1. (Continued)

Characteristic	No.	%
No insurance/charity care		
Yes	4	1
Subjective numeracy score		
Mean	4.16	
Range	1-6	
Life Orientation Test scores		
Mean	17	
Range	1-24	
"My current insurance coverage adequately covers my healthcare costs"		
Agree a lot	291	72.75
Agree a little	51	12.75
Neutral	21	5.25
Disagree a little	18	4.5
Disagree a lot	15	3.75
Missing	4	1
"I am confident that my insurance will cover my healthcare costs in the future"		
Agree a lot	157	39.25
Agree a little	80	20
Neutral	74	18.5
Disagree a little	37	9.25
Disagree a lot	32	8
Missing	20	5
"I have concerns about paying for my cancer treatment"		
Agree a lot	50	12.5
Agree a little	71	17.75
Neutral	60	15
Disagree a little	47	11.75
Disagree a lot	170	42.5
Missing	2	0.5
"My family has made financial sacrifices to pay for my medical care"		
Agree a lot	36	9
Agree a little	53	13.25
Neutral	43	10.75
Disagree a little	40	10
Disagree a lot	209	52.25
Missing	19	4.75

Previous studies have suggested that patients of lower SES may use health care treatments at lower rates and subsequently have worse clinical outcomes,[6,13] which may arise as a result of underutilization of costly treatments. For instance, in an Internet survey measuring the impact of cost on patients with cancer, 9% reported choosing not to undergo a recommended treatment because of cost; these rates are higher among those making less than $40,000 per year.[14] Therefore, we hypothesized that patients of lower SES would have greater cost concerns than patients of higher SES. However, in our study, we found that low SES was not predictive of expressing cost-related concerns. This suggests that a more heterogeneous group of patients may benefit from additional guidance about cost-related issues and

Table 2. Responses to Open-Ended Questions

Category	%	Example
Cost concern		
Inability to afford medical costs	17.3	"The best treatments are very expensive; treatments should be made more affordable."
		"Yes, my husband was out of work for 3 years, worked for a year and was just laid off. We are close to retirement age and I would not want to deplete our savings on medical treatment that would only give me 2 additional months."
Uncertainty about future costs	14.8	"Yes, especially when I turn 65 in September—I will receive Medicare. I am worried if that will cover my treatment if anything happens" "only in insurance was to be cancelled if I lost my job or if insurance didn't cover the treatment that I needed, such as a clinical trial."
		"I am scared to death that in 2 years when my insurance changes to Medicare and I don't have Medicaid anymore that I will not be able to afford to pay the 20% copay and will have to stop the chemo treatments I need for the rest of my life."
High copayments/out-of-pocket	4.2	"The monthly out-of-pocket expense at a time when a working individual is undergoing various therapies and post surgical care is a mental and financial burden to the family."
		"Yes my chemo treatment cost me $6,000 out of my pocket in 1 month before my plan started to pay."
Low insurance coverage	2.8	"I worry that at some point there will be costs that are not covered by my insurance and that I won't have the money any longer—because I am not working—to pay for it."
High cost of health insurance	2.5	"Sometimes I get nervous because our health care premiums keep going up."
Making trade-offs between costs and treatment	2.5	"Cancer patients have two primary concerns. To choose getting the best doctors and best services at a large cost or choosing the best doctors with average services for a smaller cost. Unfortunately, cost influences decisions."
		"I think it's an individual decision. Biggest question is can you afford the treatments. And you have to ask yourself this question: what is your life worth. You must have the proper attitude that you're gonna beat this damn thing. You must have the right support."
Minimal	1.7	"A slight concern."
Unspecified concerns	13.8	"I do but my health is more important. We will find a way to make ends meet."
Satisfied with insurance	6.5	"I am fortunate that I have the insurance coverage that I currently have."
No concerns	41.5	"In general, no. I have a very comprehensive insurance plan that covers everything except a low copay."
Missing	10.3	
Additional expense		
Travel	22.3	"I drive here from _____ (126 miles)−4 or more times a year normally, recently more, 20+."
		"Yes, travel expenses, hotels, loss of wages for not only patient, but for spouse as well. Expenses to pay others to transport patient back and forth to hospital when spouse could not get time off from work. (during chemo)."
		"Hotel stays in the area because of radiation."
		"I am now on my fifth bout and have to travel to Philadelphia from _____ to undergo experimental treatment."
Other medical	7.3	"I had to have my IUD removed and my husband got a vasectomy because I could not have hormonal birth control."
		"Yes, counseling and the inability to afford the rehab therapy costs because of the hospitals billing practices, charging by the facility instead of the doctor which increased the copay from $25 to $75."
Lost income	5.8	"Loss of wages-no benefits part time."
		"I used a significant amount of sick and vacation time which are paid days off and am able to accrue the time and convert into cash at retirement."
		"Loss of wages on each day I have a doctor appointment. (No sick days at my job)."
Counseling	2.3	"Both my daughter and myself have been in therapy since my first bout with cancer."
		"I had to go to therapy for my depression."
Minimal	2.5	"A little but not a major consideration."
Unspecified additional expenses	8.8	"Over the past 5 years it has been costly to my family because of my cancer!!"
No additional expenses	54.3	"Thank God, I had full coverage."
Missing	8.0	

Note. Some responses fit multiple categories; thus, percentages sum to greater than 100%. Responses were coded as "unspecified" when patients reported general concern or concerns that did not fit the coding scheme.

that even insured patients with high SES may have cost-related concerns.

We also explored whether other patient characteristics such as numeracy and dispositional optimism might also be related to cost concerns. Numeracy skills may be particularly relevant, as patients with cancer are often presented with medical data such as survival and adverse effect rates in addition to financial information on copayments and coinsurance. Although low numeracy has been linked to difficulty with making optimal treatment decisions[4] and to a systematic overestimation of

Table 3. Association Between Responses to Open-Ended Questions on Cost Concerns and Additional Costs and Closed-Ended Questions

	Disagree With						Agree With					
	"My current insurance coverage adequately covers my health care costs."			"I am confident that my insurance will cover my health care costs in the future."			"I have concerns about paying for my cancer treatment."			"My family has made financial sacrifices to pay for my medical care."		
	(n = 396)			(n = 380)			(n = 398)			(n = 381)		
Responses	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***
Cost concerns identified on open-ended questions												
No	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Yes	**2.82**	**1.53-5.2**	**0.001**	**3.39**	**2.22-5.16**	**0**	**2.83**	**1.92-4.2**	**0**	**2.56**	**1.68-3.91**	**0**
Additional expenses identified on open-ended questions												
No	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Yes	1.22	0.68-2.2	0.5	**1.79**	**1.18-2.72**	**0.01**	**1.89**	**1.27-2.81**	**0.02**	**3.08**	**2-4.73**	**0**

Higher odds ratios indicate greater cost concerns. For instance, those who listed a cost concern had 2.56 times the odds of agreeing that their family has made sacrifices to pay for their cancer care. Boldface indicates significant associations.

risks,[15] we did not find an association between low numeracy and cost concerns. In addition, we predicted that dispositional optimism would be associated with decreased cost concerns, as greater optimism has been linked to the fighting spirit coping response—the position of confronting and trying to beat cancer.[8] However, we did not find that greater dispositional optimism was protective against concerns about treatment-related costs. Measuring optimism using a more specific measure might have produced differing results. For instance, treatment-related optimism (ie, expecting a positive or better-than-average treatment outcome) has been observed to lessen declines in quality of life among patients with kidney cancer.[16]

Patients indicated diverse concerns in responses to our open-ended questions. Many of the concerns expressed were related to uncertainty about future costs, including how changes in their treatment, insurance coverage, and government policies would influence their costs. One participant wrote, "I'm never sure how long my company will have the insurance that I currently have. I'm out of state and worry my insurance will stop paying for my current [doctors] and hospital." Another wrote, "In [the] future with health care reform I do have concerns of how it may affect me," which may reflect the timing of the study, which was conducted in part during the passage of the 2010 Patient Protection and Affordable Care Act. Although such concerns may be beyond the scope of an individual treatment, they may still increase patient distress and subsequently influence treatment decisions. Helping patients to understand changes in their own medical coverage and government policy may enable them to make more informed decisions.

Identification of any cost concern in the open-ended question was associated with greater concerns in all four closed-ended questions. Similarly, identification of any specific additional expenses was also associated with greater cost concerns in three of the four closed-ended questions. Because the open-ended questions were the last in the study, the act of writing the responses would not have influenced the answers to the closed-ended questions. This association suggests that the use of closed-ended screening questions such as these might be an appropriate mechanism to help identify patients with these concerns and expenses, initiate a more detailed discussion, and direct them to appropriate resources.

This study has several limitations. We did not assess doctor-patient communication and did not measure whether cost concerns affected clinical decision making. Future research should investigate whether conversations about costs do in fact alleviate concerns and improve treatment decision making. In addition, in this cross-sectional study, we enrolled a heterogeneous group of patients with a variety of tumor types and treatment histories. Forty-one percent were diagnosed before 2006; so, for many patients, there was a significant delay between their actual treatment decisions and appraisal of treatment-related costs in this study. It is possible that perceptions of costs changed in the time since the costs were first incurred.

The results of the open-ended questions should be considered hypothesis generating. Not all patients answered the open-ended questions, and it is possible that this understates the true magnitude of the associations we identified. Further research is needed to understand whether these concerns are reflective of costs that are truly burdensome to patients. We did find a strong association between identifying additional expenses on the open-ended questions and agreeing with the statement, "my family has made sacrifices to pay for my care" (odds ratio, 3.1; 95% CI, 2.0-4.7). Although we did not define "sacrifices" in this study, this strong association suggests that patients who identified these costs noted enough distress to identify them as sacrifices.

Patients with cancer with a variety of characteristics may experience concerns about costs. Among the insured population in our study, having a positive outlook, high numeracy skills, and higher SES did not eliminate these concerns. Further work is needed to assist medical professionals in eliciting the

cost concerns of patients, so that appropriate resources may be identified to address them.

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References

1. Meropol NJ, Schulman KA: Cost of cancer care: Issues and implications. J Clin Oncol 25:180-186, 2007

2. Schrag D, Hanger M: Medical oncologists' views on communicating with patients about chemotherapy costs: A pilot survey. J Clin Oncol 25:233-237, 2007

3. Baile WF, Buckman R, Lenzi R, et al: SPIKES—A six-step protocol for delivering bad news: Application to the patient with cancer. Oncologist 5:302-311, 2000

4. McFarlane J, Riggins J, Smith TJ: SPIKE$: A six-step protocol for delivering bad news about the cost of medical care. J Clin Oncol 26:4200-4204, 2008

5. Wagner L, Lacey MD: The hidden costs of cancer care: An overview with implications and referral resources for oncology nurses. Clin J Oncol Nurs 8:279-287, 2004

6. Shankaran V, Jolly S, Blough D, et al: Risk factors for financial hardship in patients receiving adjuvant chemotherapy for colon cancer: A population-based exploratory analysis. J Clin Oncol 30:1608-1614, 2012

7. Wood S, Hanoch Y, Barnes A, et al: Numeracy and Medicare Part D: The importance of choice and literacy for numbers in optimizing decision making for Medicare's prescription drug program. Psychol Aging 26:295-307, 2011

8. Schou I, Ekeberg Ø, Ruland CM: The mediating role of appraisal and coping in the relationship between optimism-pessimism and quality of life. Psycho-oncology 14:718-727, 2005

8a. Wong YN, Egleston BL, Sachdeva K, et al: Cancer patients' trade-offs among efficacy, toxicity and out-of pocket cost in the curative and non-curative setting. Med Care (in press)

9. Zikmund-Fisher BJ, Smith DM, Ubel PA, et al: Validation of the Subjective Numeracy Scale: Effects of low numeracy on comprehension of risk communications and utility elicitations. Med Decis Making 27:663-671, 2007

10. Fagerlin A, Zikmund-Fisher BJ, Ubel PA, et al: Measuring numeracy without a math test: Development of the Subjective Numeracy Scale. Med Decis Making 27:572-580, 2007

11. Scheier MF, Carver CS: Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. Health Psychol 4:219-247, 1985

12. Hosmer D, Lemeshow S: Applied Logistic Regression. New York, NY, Wiley, 2000

13. Hsu J, Price M, Huang J, et al: Unintended consequences of caps on Medicare drug benefits. N Engl J Med 354:2349-2359, 2006

14. Markman M, Luce R: Impact of the cost of cancer treatment: An Internet-based survey. J Oncol Pract 6:69-73, 2010

15. Gurmankin AD, Baron J, Armstrong K: Intended message versus message received in hypothetical physician risk communications: Exploring the gap. Risk Anal 24:1337-1347, 2004

16. Milbury K, Tannir NM, Cohen L: Treatment-related optimism protects quality of life in a phase II clinical trial for metastatic renal cell carcinoma. Ann Behav Med 42:313-320, 2011

Appendix

Table A1. Univariate Associations Between Patient Characteristics and Increased Cost Concerns

	Disagree With						Agree With					
	"My current insurance coverage adequately covers my health care costs." (n = 396)			"I am confident that my insurance will cover my health care costs in the future" (n = 380)			"I have concerns about paying for my cancer treatment" (n = 398)			"My family has made financial sacrifices to pay for my medical care." (n = 381)		
Characteristic	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***
Age (per year)	0.99	0.97 to 1.01	.33	0.99	0.98 to 1.01	.37	1	0.82 to 1.22	1	0.96	0.94 to 0.98	0
Sex												
Male	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Female	0.98	0.50 to 1.29	.36	1.05	0.69 to 1.60	.83	1.26	0.85 to 1.87	.26	1.53	0.98 to 2.36	.06
Annual income, $												
> 60,000	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
< 60,000	**2.19**	**1.17 to 4.12**	**.02**	1.07	0.70 to 1.63	.77	**1.6**	**1.07 to 2.40**	**.02**	1.06	0.69 to 1.65	.78
Employment												
Unemployed	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Other	0.55	0.24 to 1.28	.17	0.44	0.23 to 0.81	.01	**0.48**	**0.26 to 0.89**	**.02**	0.69	0.36 to 1.31	.25
Education												
4-year degree	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
No degree	1.2	0.67 to 2.17	.55	1.29	0.85 to 1.96	.23	**1.56**	**1.06 to 2.32**	**.03**	1.28	0.83 to 1.96	.27
Marital status												
Married	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Unmarried	**1.74**	**1.30 to 2.33**	**0**	1.03	0.83 to 1.28	.79	0.99	0.97 to 1.00	.09	0.87	0.70 to 1.09	.24
Numeracy	**0.75**	**0.58 to 0.96**	**.02**	0.88	0.74 to 1.05	.16	**0.75**	**0.63 to 0.89**	**0**	0.89	0.74 to 1.07	.21
Optimism	**0.93**	**0.88 to 0.98**	**.01**	**0.96**	**0.92 to 1.00**	**.03**	0.96	0.92 to 0.99	.02	0.97	0.94 to 1.01	.19

NOTE. Higher odds ratios indicate greater cost concerns. For instance, those making less than $60,000, had 1.6 times the odds of agreeing that they had concerns about paying for their cancer treatment. "Other" for employment refers to any other status than unemployed (ie working, retired, student, homemaker). Hospital site and presence of metastatic disease were not associated with any outcome variable. Optimism and numeracy odds ratios refer to per-point increases. Analyses using a four-level income variable produced similar results. Boldface indicates significant associations.
Abbreviations: OR, odds ratio; Ref, reference.

Table A2. Multivariable Associations Between Treatment Characteristics and Increased Cost Concerns

	Disagree With						Agree With					
	"My current insurance coverage adequately covers my healthcare costs."			"I am confident that my insurance will cover my healthcare costs in the future"			"I have concerns about paying for my cancer treatment"			"My family has made financial sacrifices to pay for my medical care."		
	(n = 345)			(n = 332)			(n = 346)			(n = 333)		
Characteristic	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***	**OR**	**95% CI**	***P***
Age (per year)	0.99	0.96 to 1.01	.28	1	0.98 to 1.02	.97	0.99	0.97 to 1.01	.46	0.96	0.94 to 0.98	0
Sex												
Male	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Female	0.81	0.41 to 1.60	.54	1.12	0.70 to 1.80	.63	1.28	0.81 to 2.02	.3	1.17	0.70 to 1.95	.55
Annual income, $												
> 60,000	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
< 60,000	1.88	0.88 to 4.00	.1	0.93	0.56 to 1.54	.79	1.53	0.95 to 2.47	.08	1.3	0.76 to 2.22	.34
Employment												
Unemployed	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Other	0.92	0.33 to 2.60	.88	0.58	0.20 to 1.16	.12	0.73	0.36 to 1.46	.37	0.94	0.45 to 1.96	.87
Education												
4-year degree	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
No degree	0.73	0.32 to 1.64	.44	1.13	0.67 to 1.92	.64	1.1	0.66 to 1.83	.71	1.25	0.71 to 2.20	.45
Marital status												
Married	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Unmarried	**1.58**	**1.13 to 2.23**	**.01**	0.98	0.77 to 1.25	.89	0.83	0.65 to 1.06	.14	0.79	0.61 to 1.04	.09
Numeracy	0.9	0.64 to 1.26	.53	0.98	0.78 to 1.23	.85	0.86	0.69 to 1.07	.17	1	0.78 to 1.27	.97
Optimism	**0.94**	**0.89 to 1.00**	**.06**	**0.96**	**0.02 to 1.00**	**.05**	0.97	0.93 to 1.01	.15	0.98	0.94 to 1.03	.47

NOTE. Higher odds ratios indicate greater concerns. Analyses that included only the significant univariate predictors within each question yielded the same pattern of results. Optimism and numeracy odds ratios refer to per-point increases. Boldface indicates significant associations.
Abbreviations: OR, odds ratio; Ref, reference.