

# Healthcare satisfaction in older and younger patients with cancer

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## ABSTRACT

**Objective:** Although older patients represent the most rapidly growing segment of the oncology population, clinical care is guided by very little data on patient-reported outcomes, particularly satisfaction with healthcare. Using a large cancer center registry, we sought to describe factors associated with satisfaction with care for older and younger oncology patients.

**Methods:** Data were collected through the University of North Carolina Health Registry Cancer Survivorship Cohort. Satisfaction was measured with the Patient Satisfaction Questionnaire Short Form. Quality of life (QOL) measures included were the Promis Global short form and the Functional Assessment of Cancer Therapy General (FACT-G).

**Results:** A total of 2385 patients were included. 460 (20%) were aged 70 and above (older group). Older patients reported significantly higher levels of satisfaction in domains of time spent with doctor (scores 3.84 versus 3.73  $p = 0.03$ ) and financial aspects (scores 4.03 versus 3.44  $p < 0.001$ ) compared to younger patients. In multivariable analysis, higher QOL scores and higher self-reported ECOG performance status were associated with higher satisfaction scores. African American race was associated with lower satisfaction scores in all age groups. QOL was more closely correlated with satisfaction in older patients compared to younger patients.

**Conclusions:** Older patients with cancer report higher levels of satisfaction with care, in part due to lesser financial burden of care. Better QOL is associated with satisfaction with care in older patients. Use of patient-reported outcomes such as patient satisfaction may help improve patient-centered geriatric oncology care.

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## 1. Introduction

Older patients represent a rapidly growing segment of the cancer population. By 2030, approximately 70% of cancers in the United States will be diagnosed in people over 65.<sup>1</sup> Management of older patients with cancer poses unique challenges including managing multiple comorbidities and their effect on life expectancy, differential response to therapy, and risks of complications. Health services data suggest that older patients are often undertreated in all modalities of oncologic care.<sup>2</sup> However, older patients may have different priorities, such as preservation of functional status rather than absolute longevity, compared to their younger counterparts.<sup>3</sup>

Patient-reported outcomes, including patient satisfaction, have been increasingly used in oncology studies and have been shown to enable improved quality of care.<sup>4</sup> However, even within the geriatric oncology literature, there is a paucity of data examining these outcomes in older patients. Without research which addresses satisfaction with care in the older adult population, it is difficult to know how best to implement measures to maximize quality of care which remain patient-centered in focus. Patient satisfaction with healthcare is an essential patient-reported outcome to transform geriatric services, yet it has not been examined in a broad population of older patients with cancer.

Using data from a large university health center cancer registry that merges patient-reported outcome reports with extensive demographic and clinical data, we sought to describe satisfaction with care in multiple domains for older and younger oncology patients. We also sought to analyze factors associated with patient satisfaction across age cohorts including demographic, clinical, and quality of life (QOL) data.

## 2. Methods

### 2.1. Study Sample

Data were collected through the University of North Carolina Health Registry Cancer Survivorship Cohort (UNC HR/CRC). The UNC HR/CRC is a large hospital-based registry of cancer patients designed to improve care across the cancer spectrum.<sup>5</sup> This study integrates a database of clinical, epidemiological, and interview data with biologic specimens. A global informed consent covers all aspects of participation. The UNC School of Medicine Institutional Review Board (IRB) gave approval for the Registry study and for this substudy.

Eligibility criteria for the Registry include age 18 years of age or older, cancer diagnosis, resident of North Carolina, and have attended an appointment in the University of North Carolina Hospital system. Patients with a new cancer diagnosis are preferentially recruited and enrolled; however, patients may also enroll during treatment or follow-up period. Within 2 weeks of enrollment, patients are asked to complete an interview with data on patient-reported outcomes measured using validated instruments. The complete assessment requires 1–2 hours of patient participation.

For this study, the sample included participants in the UNC HR/CRC registry who completed the Patient Satisfaction

Questionnaire Short Form (PSQ-18) as part of the initial study interview.

### 2.2. Measures

Data were collected from the HR/CSC questionnaire and medical record abstraction. The questionnaire included basic demographic information and a self-report of performance status, using the Eastern Cooperative Oncology Group (ECOG) scale.

Satisfaction with care was measured in the questionnaire with PSQ-18 (Addendum 1). This measure of satisfaction with healthcare has established internal and external validity has been used in various settings.<sup>6–8</sup> It includes 18 items which are categorized into 7 subscales: general satisfaction, technical quality (proficiency), interpersonal manner, communication, financial aspects, time spent with doctor, and accessibility and convenience. Each item is scored on a scale from 1 to 5 with higher scores indicating higher satisfaction. Sub-scale scores represent average scores for items within that domain. Cronbach's coefficient alpha of internal reliability ranges from 0.74 to 0.95 for each subscale score.<sup>6</sup>

Two separate instruments were used as part of the interview questionnaire to measure general and cancer-specific aspects of QOL. The PROMIS Global Health short form is a 10-item general QOL instrument assessing multiple domains. It has been validated in several studies including patients with chronic disease.<sup>9–11</sup> PROMIS has two component scales: Global Physical Health (Promis Physical) and Global Mental Health (Promis Mental) which are scored separately. Higher scores represent better functioning. Raw scores range from 4 to 20 and were subsequently converted to T score values using published methodology. T score distributions are standardized such that a score of 50 represents the mean for the US general population, and the standard deviation around that mean is 10 points. T scores range from 16.2 to 67.7 again with higher scores representing better functioning.<sup>12</sup> The scales have internal consistency reliability coefficients of 0.81 and 0.86 for physical and mental components, respectively.<sup>13</sup>

The Functional Assessment of Cancer Therapy General (FACT-G) is a 27-item cancer-specific QOL measure which has been validated and used in multiple populations.<sup>14</sup> It is divided into subscales of physical well-being, social/family well-being, emotional well-being and functional well-being. Each question is scored on a 5-point Likert-type scale and evaluates QOL during the previous week. Scores from each subscale are added for a total score which ranges from 0 to 108 with higher scores indicating better QOL. Cronbach's coefficient alpha of reliability and consistency is 0.92 for the total score.<sup>14</sup>

As part of HR/CRC, medical record abstraction is completed for each patient after completion of the interview. Information abstracted includes date of diagnosis, initial stage, and first course of treatment. In the HR/CSC sample, approximately 50% of patients had complete medical record abstraction. Prior to analysis in this study, HR/CRC personnel performed additional abstraction of cancer site and initial stage for older patients who had completed the PSQ-18 to further enrich data for this group.

**Table 1 – Basic demographic and clinical information by age group.**

	All	Age <50	Age 50–69	Age 70+
Number of pts, n (%)	2385 (100)	522 (22)	1403 (59)	460 (20)
Mean age [range]	59 [21–93]	41 [21–49]	60 [50–69]	76 [70–93]
<i>Sex, n (%)</i>				
Male	832 (35)	128 (25)	505 (36)	199 (43)
Female	1553 (65)	394 (76)	898 (64)	261 (57)
<i>Race, n (%)</i>				
White	1913 (80)	381 (72)	1114 (79)	418 (91)
African American	371 (16)	108 (21)	232 (17)	31 (7)
Other/Unknown	101 (4)	33 (6)	57 (4)	11 (2)
<i>Education level, n (%)</i>				
Non-high school grad	143 (6)	26 (5)	82 (6)	35 (8)
High school	517 (22)	110 (21)	303 (22)	104 (23)
Some college	644 (27)	139 (27)	386 (28)	119 (26)
College degree or higher	1065 (45)	242 (46)	621 (44)	202 (44)
Unknown	16 (1)	5 (1)	11 (1)	0 (0)
<i>Tumor type, n (%)</i>				
Breast	515 (22)	128 (25)	297 (21)	90 (20)
Colorectal	210 (9)	46 (9)	123 (9)	41 (9)
Prostate	144 (6)	12 (2)	87 (6)	45 (10)
Uterine	126 (5)	14 (3)	64 (5)	48 (10)
Bladder	90 (4)	4 (1)	30 (2)	56 (12)
Skin	87 (4)	17 (3)	32 (2)	38 (8)
Esophageal/stomach	63 (3)	11 (2)	32 (2)	20 (4)
Kidney	62 (3)	10 (2)	31 (2)	20 (4)
Liver/biliary	50 (2)	2 (0)	34 (2)	14 (3)
Pancreas	42 (2)	2 (0)	27 (2)	13 (3)
Ovary	34	3 (1)	19 (1)	12 (3)
Lung	24	2 (0)	11 (1)	11 (2)
Cervical	23	17 (3)	6 (0)	0 (0)
Small intestine	22	2 (0)	19 (1)	1 (0)
Vulva/Vagina	16	4 (1)	8 (1)	4 (1)
Head and neck	15	2 (0)	10 (1)	3 (1)
Testes	14	11 (2)	3 (0)	0 (0)
Hematologic	15	3 (1)	8 (1)	4 (1)
Unknown primary	12	1 (0)	8 (1)	3 (1)
Thyroid	11	7 (1)	3 (0)	1 (0)
Anal	10	0 (0)	9 (1)	1 (0)
Other	22	2 (0)	15 (1)	5 (1)
Unknown	779 (33)	222 (43)	535 (38)	30 (7)
<i>Stage, n (%)</i>				
Early (0-3)	1273 (53)	242 (46)	709 (51)	322 (70)
Metastatic	170 (7)	33 (6)	101 (7)	36 (8)
Not applicable	14 (1)	1 (0)	8 (1)	5 (1)
Unknown	928 (39)	246 (47)	585 (42)	97 (21)
<i>QOL*</i>				
Mean FACT-G score (range)	82 (12–108)	80 (19–108)	82 (13–108)	85 (30–108)
Mean Promis physical score (range)	47 (16–68)	47 (20–68)	47 (16–68)	48 (24–68)
Mean Promis Mental score (range)	50 (21–68)	49 (21–68)	50 (21–68)	51 (25–68)
<i>Performance status (self-report)</i>				
0–1	1991 (84)	437(84)	1164 (83)	390 (85)
2 or higher	390 (16)	84 (16)	237 (17)	69 (15)
Unknown	4 (0)	1 (0)	2 (0)	1 (0)

\* Normal score range 0–108 for FACT-G and 16–68 for Promis. See [Measures](#) section for details.

### 2.3. Statistical Analysis

Fisher's exact tests were used to compare percentages among categories, and linear regression analyses were used to evaluate the relationship of clinical and demographic characteristics with satisfaction scores.

Using the entire patient cohort, we performed univariable and multivariable regression analyses to assess factors associated with satisfaction. Factors included in multivariable analysis were age (continuous variable), race (white versus African American versus other), education level (high school or lower versus any college), first language (English versus other), stage (early versus late versus unknown), ECOG performance status (0–1 versus 2 or more), FACT-G, Promis Physical, and Promis Mental Scores. For the older patient subset analysis, additional variables included cancer type (using the four most common tumor types) and number of people living with them (none versus 1 or more) as a surrogate for social support.

Finally, Pearson correlation coefficients were used to measure the correlation between continuous scores. All analyses were performed using SAS statistical software version 9.3 (SAS Institute Inc., Cary, NC).

## 3. Results

### 3.1. Demographic and Clinical Characteristics

Of 4466 Health Registry participants, 2385 (53%) completed the PSQ-18 and were included in this analysis. Compared to patients who did not complete the PSQ-18, patients who completed the questionnaire were slightly older: mean age  $58 \pm 12.5$  compared to mean age of  $54 \pm 14.6$ . The groups were similar in terms of gender and race distribution.

Study participants were divided into three age categories for analysis: younger (aged under 50), middle aged (ages 50–69), and older (age 70 and above).

Table 1 describes the demographic and clinical characteristics of the study sample. There were more male and white patients in the older and middle-aged cohorts compared to the younger group ( $p < 0.0001$ ). There were also significantly

more non-English-speaking patients in the younger age group ( $p = 0.0002$ ). Groups were well matched for education level, with 45% having a college degree or higher. Patients had a variety of tumor types with breast cancer being the most common. Older patients had the highest percentage of early-stage cancer; however, stage was unknown for a large part of the sample. Compared to patients under 50, older patients reported higher cancer-specific QOL indicated by higher scores on FACT-G (mean score 85 versus 80,  $p < 0.0001$ ) and Promis Mental (mean score 51 versus 49  $p = 0.001$ ). Self-reported performance status was similar across the groups, with 84% of respondents reporting 0–1. Approximately 50% of patients completed the questionnaire within 6 months of their most recent treatment.

### 3.2. Patient Satisfaction Scores

Patient satisfaction by subscale and age group is summarized in Table 2. Overall patients reported high levels of satisfaction compared to population-based means. As age increased, so did scores for satisfaction with financial aspects of care: out of a maximum score of 5, scores were 3.44, 3.63, and 4.03 for younger, middle-aged, and older patients, respectively ( $p < 0.0001$ ). Older and middle-aged patients also reported higher satisfaction scores in time spent with their doctor compared to younger patients (score 3.84, 3.84, 3.73,  $p = 0.03$ ). Otherwise, there were no significant differences in satisfaction scores across age categories.

### 3.3. Associations with Satisfaction with Care in All Age Groups

Results of multivariable analysis are summarized in Table 3. In multivariable analysis, older age was associated with higher satisfaction scores in financial aspects of care and lower scores in technical quality ( $p$  values  $< 0.0001$  and  $0.0057$ , respectively). Higher scores (indicating better QOL) in FACT-G and Promis Mental scales were associated with higher satisfaction in all subscales. African American race had a negative association with satisfaction in 5 subscales (technical quality, interpersonal manner, financial aspects, time spent with doctor, and accessibility and convenience). College education was associated with lower scores in general

**Table 2 – PSQ-18 scores by subscale and age group,  $p$  values indicate differences between older and younger age group scores. Population-based means reflect data that were obtained during development and validation of instrument in various healthcare settings.**

	Published population-based mean $\pm$ SD [7]	Overall results (95% CI*) n = 2385	Age <50 (95% CI) n = 522	Age 50–69 (95% CI) n = 1403	Age 70+ (95% CI) n = 460	$p$
General satisfaction	3.58 $\pm$ 0.94	3.97 (3.94–4.00)	3.91 (3.83–3.98)	3.99 (3.95–4.03)	3.99 (3.92–4.06)	0.13
Technical quality	3.68 $\pm$ 0.76	3.96 (3.93–3.98)	3.93 (3.87–4.00)	3.97 (3.93–4.00)	3.95 (3.89–4.01)	0.58
Interpersonal manner	4.09 $\pm$ 0.69	4.18 (4.16–4.21)	4.16 (4.10–4.22)	4.18 (4.15–4.21)	4.22 (4.17–4.27)	0.33
Communication	3.74 $\pm$ 0.87	4.06 (4.03–4.09)	4.02 (3.96–4.09)	4.07 (4.03–4.10)	4.06 (4.00–4.13)	0.49
Financial aspects	3.78 $\pm$ 0.94	3.67 (3.63–3.70)	3.44 (3.35–3.53)	3.63 (3.58–3.68)	4.03 (3.96–4.09)	<0.0001
Time spent with doctor	3.59 $\pm$ 0.94	3.81 (3.78–3.85)	3.73 (3.65–3.80)	3.84 (3.79–3.88)	3.84 (3.77–3.91)	0.03
Accessibility and convenience	3.76 $\pm$ 0.74	3.89 (3.87–3.92)	3.86 (3.80–3.91)	3.89 (3.86–3.92)	3.93 (3.88–3.98)	0.17

\* CI = confidence interval.

**Table 3 – Summary of significant associations of demographic, functional, and QOL variables with satisfaction in multivariable analyses.**

	Positive association: all patients	Negative association: all patients	Positive association: older patients	Negative association: older patients
General satisfaction	FACT-G score Promis Mental score	College education	Other race FACT-G score Promis Mental score	
Technical quality	FACT-G score Promis Mental score ECOG 2 or more	Older age African American	Other race Promis Mental score	African American
Interpersonal manner	FACT-G score Promis Mental score ECOG 2 or more	African American	Promis Mental score ECOG 2 or more	
Communication	FACT-G score Promis Mental score ECOG 2 or more	College education	Promis Mental score Living with 1 or more people	
Financial aspects	Older age College education FACT-G score Promis Mental score ECOG 2 or more	African American	College education ECOG 2 or more	African American
Time spent with MD	FACT-G score Promis Mental score ECOG 2 or more Advanced stage	African American College education	Promis Mental score	
Accessibility and convenience	FACT-G score Promis Mental score	African American	FACT-G score	

satisfaction, communication, and time spent with doctor, and higher scores in financial aspects. Self-reported poor performance status was associated with higher scores in 5 subscales (technical quality, interpersonal manner, communication, financial aspects, time spent with doctor).

Since the Promis Mental score was associated with satisfaction in all subscales, we further explored the relationship of Promis Mental scores to satisfaction across age groups. Compared to patients under 70, older patients had stronger associations of satisfaction with Promis Mental scores. For general satisfaction, the Pearson correlation coefficient (range 0–1 with higher values indicating stronger association) was 0.27 in patients over 70 compared to 0.17 in younger patients; in communication, correlation coefficient was 0.35 versus 0.21; and for time spent with doctor, it was 0.27 compared to 0.18.

### 3.4. Associations with Older Patients' Satisfaction with Care

In the 460 patients aged 70 and above, we performed separate univariable and multivariable analysis (Table 3). For this analysis, we included additional variables: cancer type (using the four most common tumor types) and number of people living with them as a surrogate for social support. Overall, we found similar results with high scores on QOL measures associated with higher levels of satisfaction. College education was again associated higher satisfaction in financial aspects, but associations were not significant in the other domains. Living with 1 or more person was associated with higher scores in the communication subscale ( $p = 0.0191$ ).

### 3.5. Characteristics of Patients with Low Satisfaction Scores

Although the majority of patients reported high levels of satisfaction, a small number of patients were dissatisfied with

aspects of care indicated by score of less than 3 in each subscale (Fig. 1). Overall, the percentage of dissatisfied patients was no higher than 16%, with the most dissatisfaction being reported for financial aspects and time spent with their doctor. Differences in dissatisfaction were seen between age groups for interpersonal manner, financial aspects and accessibility/convenience. Over 20% of younger and middle-aged patients reported dissatisfaction regarding financial aspects of care (24% and 17% of patients, respectively), compared to only 5% of patients over 70 ( $p < 0.0001$ ). In older patients, the subscale where low scores were most commonly reported was in time spent with their doctor (45 patients, 10%).

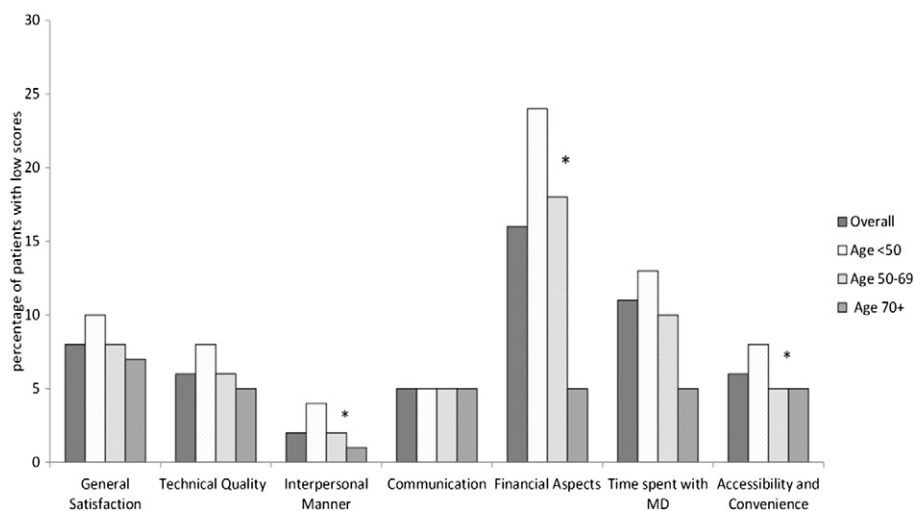
We explored the group of patients who expressed a global dissatisfaction with care, defined in this analysis as satisfaction scores less than 3 in two or more subscales. This included 85 younger patients (16%), 176 middle-aged patients (12%), and 42 older patients (9%). Demographic characteristics were similar between satisfied and dissatisfied patients. However, in middle-aged patients, dissatisfied patients were more likely to have a college education ( $p = 0.024$ ) and in the older group, dissatisfied patients were more likely to be African American ( $p = 0.01$ ).

## 4. Discussion

To our knowledge, this is the largest study to describe the effect of age on patient satisfaction with healthcare in oncology patients. While patients in our study reported high levels of satisfaction, several important differences in patterns and associations with satisfaction were noted across age groups, and these should be considered in clinical practice.

Overall, older adults reported somewhat higher levels of satisfaction compared to their younger counterparts. In





**Fig. 1 – Percentage of patients with satisfaction scores under 3 by subscale and age group. \*Statistically significant difference.**

particular, we showed that the financial burden of care contributes significantly to dissatisfaction in younger patients, but improves in older patients, likely due to more comprehensive insurance coverage (Medicare) for patients over 65. If older patients did express dissatisfaction, the most common domain was in time spent with the doctor, and older age was associated with lower scores in technical quality satisfaction in multivariable analysis. This may reflect different expectations of care and attention from their primary oncology provider.

College education was associated with lower levels of satisfaction in several domains in the overall cohort but was not significant when the older group was analyzed separately. This suggests that while younger patients with high levels of education may have higher expectations for their medical care than is delivered, but the effect dissipates in the older population as other priorities may come to the forefront.

Several predictors of satisfaction were constant across the age spectrum. African American patients expressed lower levels of satisfaction with care, including in the older group. This is consistent with existing literature.<sup>15-17</sup> The reasons for this are likely multifactorial including health disparities, mistrust, health literacy, and differences in patterns of communication.<sup>15,18</sup> Although we were not able to elucidate these aspects using our data set, further research about potential strategies to improve satisfaction in racial minority patients is clearly needed. Patients with self-reported poor functional status interestingly reported higher levels of satisfaction, independent of QOL. This may be as a result of increased time and attention dedicated to patients of borderline functional status considering potentially curative treatment.

Quality of life, particularly psychological function, was associated with satisfaction in all patients, but more closely in the older patient group. Literature suggests that older patients with cancer still have relatively high levels of depression and anxiety.<sup>19</sup> However, late life depression remains underrecognized and undertreated, particularly in patients with medical comorbidities.<sup>20,21</sup> Fortunately, non-pharmacologic and pharmacologic strategies can be effective in depressive symptoms in older adults.<sup>22</sup> Our data suggest that more careful attention to patients' psychological state may result in higher levels of

satisfaction with care. In particular, the Promis Mental self-assessment may be a useful tool in geriatric oncology.

The strengths of this study include large sample size, with a good representation of African American patients. However, we recognize that our sample consisted primarily of patients with early-stage disease and relatively high education. Enrollment in the Health Registry did require at least 1 hour of patient participation, which is likely more difficult for patients with symptomatic advanced disease. It likely limits older patients who may be dependent on others for transportation to appointments. The time commitment may also explain the relatively low participation rate for patients with lung cancer relative.

Additionally, another limitation of the study includes lack of complete stage and treatment data. We did additional medical record abstraction for stage in the elderly cohort, and stage distribution was similar to that from the previously collected data. Therefore, we suspect staging data presented reflects that of the entire cohort. Unfortunately, this cross-sectional analysis did not allow us to assess the effect of different treatment modalities on satisfaction, a question which would likely be better addressed in a prospective review. In addition, the cross-sectional nature of associations means this analysis cannot establish directional causation. For example, high-quality healthcare may improve psychological quality of life. Alternatively, psychological well-being may result in more positive attitudes toward some aspects of care. Although we did not have data about socioeconomic status, we had near complete data about educational attainment which can be a surrogate.<sup>23</sup>

This study supports the growing body of literature which recognizes the importance of patient-reported outcomes in assessing and improving quality of cancer care.<sup>4,10,24</sup> As the population ages, traditional principles of patient assessment cannot be universally applied to older oncology patients. Our results suggest that while clinicians can be reassured that satisfaction in older patients with cancer is high, their expectations with respect to care will be different than that of younger patients. The financial burden of care clearly weighs heavily on younger patients, while older patients' levels of satisfaction will be more strongly influenced by their

QOL. Incorporation of patient-reported measures of QOL, in particular mental health measures, and satisfaction with care should be integral parts of geriatric oncology studies moving forward.

## Disclosures and Conflict of Interest Statements

The authors have no disclosures or conflicts of interest to report.

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