HEALTH-RELATED QUALITY OF LIFE IN ELDERLY BLACK AND WHITE PATIENTS WITH CANCER: RESULTS FROM MEDICARE MANAGED CARE POPULATION

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Objective: To compare differences in various aspects of health-related quality of life (HRQOL) between Black and White individuals diagnosed with cancer.

Design: The data were extracted from 2005–2007 Medicare Health Outcome Survey, a health outcomes measure for the Medicare population in managed care settings. A total of 14089 Black and White respondents aged ≥65 with cancer were included in the study. Multivariable linear regressions were used to assess the association between race and the HRQOL after accounting for age, sex, education years, marital status, and non-cancer comorbid conditions.

Results: When compared with their White counterparts, Black patients had lower scores for the physical component summary (PCS) and mental component summary (MCS), and all health domains with the exception of vitality. After adjusting for demographic features and comorbid conditions, the MCS scores of Black patients were still lower than that of White patients. However, the mean PCS was not different for Black and White patients. Black patients had significantly lower HRQOL in general health, social functioning, and role emotion, whereas they had a higher mean score in vitality.

Conclusions: Race had a significant impact on quality of life for older cancer patients. The effect was likely to be moderated by comorbid conditions and socioeconomic indicators. To optimize cancer outcomes at the population level, it is important to identify subgroups of cancer patients with an increased risk of low quality of life and to develop appropriate supportive interventions of cancer care. (*Ethn Dis.* 2012;22[3]:302–307)

Key Words: Health-related Quality of Life, Race, Cancer

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INTRODUCTION

Persons aged ≥65 years bear the greater burden of cancer in the United States. Despite the recognized improvement in cancer prevention and control, cancer patients are at risk for comorbid conditions and accelerated functional decline. Cancer and its treatment often have substantial impact on health-related quality of life (HRQOL) in several domains. Cancer patients experience high levels of psychological distress in connection with diagnosis.[1–3] Comparisons of patients with cancer and without cancer in Medicare managed care have shown that cancer patients reported significantly poorer physical and mental health.[4]

Research on quality of life (QOL) of cancer patients is an important component of cancer outcome research. The examination of QOL implies recognizing a patient as a whole person, an integration of body, mind and spirit.[5] Studies of QOL provide insights into the reaction of patients to cancer and cancer treatment,[6,7] and findings of such studies may lead to a better understanding of the patient's physical and psychological needs and, as a result, promote supportive care for cancer patients.[8] Khanna and Tsevat[9(p S218)] claim that for many chronic illnesses, "survival per se is no longer perceived to be the only end point; the goal is to improve, restore, and preserve QOL."

Racial disparities in cancer incidence and survival have been well documented[10–12] with African Americans having the highest mortality rate and shortest survival time of any racial or ethnic groups in the United States for most major cancers.[13] Much less research has focused on racial disparities in the pattern of QOL among cancer patients. Previous research on some cancer sites has yielded mixed evidence. Eton et al[14] found that African American prostate cancer patients reported significantly lower levels of physical functioning than did White patients after controlling for treatment type, comorbidities, and age. On the other hand, in a study on quality of life following prostate cancer diagnosis, Halbert et al[15] reported that although there were no racial differences in physical functioning, African American men had better emotional well-being as compared to White men after adjusting for economic factors, subjective stress, and religiosity.

There is a strong need for population-based research that investigates the extent to which race contributes to the decrease in HRQOL among elderly cancer patients. The objective of our study was to compare physical and mental health of Black and White individuals aged ≥65 who were diagnosed with cancer. Using the Medicare Health Outcomes Survey (MHOS), we expected our study to provide a better understanding of the burden of cancer on HRQOL across racial groups.

METHODS

Data

The data were extracted from 2005–2007 MHOS, a health outcomes measure for the Medicare population in managed care settings.[16] The MHOS was developed by the National Com-

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mittee for Quality Assurance under contract to the Centers for Medicare & Medicaid Services. The survey design is based on a randomly selected sample of individuals from Medicare Beneficiaries enrolled in Medicare Advantage (formerly Medicare +Choice) insurance plan and measures physical and mental health over a two-year period. Three methods were used in data collection:

mail, telephone, and mixed methods. Since 1998, a cohort is randomly selected each year for baseline measures and a 2-year follow-up assessment.

The data used in our study are responses from the 2005 baseline survey completed by cohort 8. This study included only self-identified Black and White respondents aged ≥65 who responded positively to the question of whether a physician had ever told him/her they had any cancer other than skin cancer. A total of 14089 individuals were included in the analyses.

Measures

The HRQOL was measured with the Medical Outcomes Study Short Form-36 (SF-36, version 1). This instrument has been widely used in clinical studies and has been demonstrated to have adequate psychometric integrity.[17,18] The survey is a generic

self-report that yields an eight scale profile of scores, as well as physical and mental health summary measures. The eight health domains include: 1) physical functioning (limitations in physical activities due to health problems); 2) role physical (limitations in usual role activities due to physical-health problems); 3) bodily pain; 4) general health perceptions; 5) vitality (energy and fatigue); 6) social functioning (limitations in social activities due to health problems); 7) role emotional (role limitations due to emotional-health problems); and 8) mental health. Each of the eight dimensions is separately scored, using item weighting and additive scaling. Summed data are transformed onto a 0–100-point scale. These eight dimensions can be combined into summary component scores: a physical component summary (PCS) and a mental component summary (MCS). A higher score represents better functioning on both sub-scales and the summary components.

Several covariates were included in the analyses. We used two age groups: 65–74 and ≥75 years. Educational attainment was categorized into <high school, high school graduate, and >high school. Marital status was dichotomized as either married or not married. Participants also reported whether or not they had been told by a doctor that they had any of the pre-existing non-cancer chronic conditions before time of survey—hypertension, angina or coronary artery disease, congestive heart failure (CHF), myocardial infarction/heart attack, other heart conditions, stroke, emphysema/asthma/chronic obstructive pulmonary disease (COPD), gastrointestinal disorders (Crohn's Disease/inflammatory bowel disease [IBD]), arthritis of the hip or knee, arthritis of the hand or wrist, sciatica, and diabetes.

Statistical Analyses

We conducted descriptive analyses of Black and White cancer patients for sociodemographic characteristics and

Table 1. Sample characteristics by race: MHOS 2005–2007 baseline data

	Black (*n*=950) %	White (*n*=13139) %	*P*
Demographics			
Age			<.001
65–74	51.3%	41.2%	
≥75	48.7%	58.8%	
Sex			.12
Male	47.7%	45.0%	
Female	52.3%	55.0%	
Marital Status			<.001
Married	37.9%	56.7%	
Not married	62.1%	43.3%	
Education			<.001
<High school	49.5%	23.7%	
High school/GED	27.0%	38.6%	
>High school	23.5%	37.7%	
Comorbidities			
Hypertension	82.5%	63.7%	<.001
Angina or coronary artery disease	15.7%	19.1%	.01
Congestive heart failure	11.9%	10.9%	.41
Heart attack	11.5%	13.9%	<.05
Stroke	13.7%	10.2%	<.001
Other heart conditions	28.2%	27.0%	.43
Emphysema, asthma, or COPD	17.4%	17.8%	.72
Crohn disease, ulcerative colitis, or irritable bowel disease	5.6%	6.7%	.20
Arthritis of the hand and wrist	41.9%	40.9%	.53
Arthritis of the hip or knee	58.0%	47.2%	<.001
Sciatica	30.2%	25.4%	=.001
Diabetes	37.4%	21.1%	<.001

Table 2. Comparisons of SF-36 scores of Black and White cancer patients: MHOS 2005–2007 baseline data

SF-36 scale	Black mean (SD)	White mean (SD)	P
Physical functioning	49.2 (28.7)	55.0 (30.4)	<.001
Role-physical	41.6 (43.7)	46.3 (43.5)	.02
Bodily pain	54.7 (27.0)	57.7 (26.2)	.001
General health	50.4 (21.2)	57.0 (22.6)	<.001
Vitality	51.1 (20.4)	50.6 (22.8)	.50
Social functioning	67.6 (28.3)	73.3 (28.5)	<.001
Role-emotion	60.3 (43.4)	71.2 (40.4)	<.001
Mental health	72.7 (18.5)	75.2 (18.5)	<.001
Physical component summary	35.3 (11.1)	37.2 (12.1)	<.001
Mental component summary	49.6 (10.7)	51.5 (10.5)	.02

SD, standard deviation.

chronic conditions. Bivariate analyses were used to determine differences in eight health dimensions and physical and mental health summary measures between the two racial groups. Multivariable linear regressions were used to assess the association between race and the SF-36 scale scores after accounting for age, sex, marital status, education years, and non-cancer comorbid conditions. Adjusted means of each SF36 score were calculated for both Black and White patients. We also examined the interaction of comorbid conditions and race in the regression models for PCS and MCS respectively. A significant interaction term indicated that the association between comorbid conditions and HRQOL differed by race. If the interaction term was significant, we then reported the effect of comorbidities on the summary component scores separately by race. All *P* are two-tailed, with values <.05 considered statistically significant.

RESULTS

Table 1 presents the sample characteristics of Black and White respondents. Overall, Black respondents were younger (51% aged 65–74) as compared to their White counterparts (41% aged 65–74). Over half of the White respondents were currently married while only slightly more than one third of the Black respondents were married.

Nearly half of the Black respondents had less than a high school education, whereas only about 23% of the White respondents were in this category. Compared to White respondents, Black respondents were significantly more likely to experience non-cancer medical conditions including hypertension, stroke, arthritis of the hip or knee, sciatica, and diabetes. Whites were more likely to have experienced angina and heart disease.

Table 2 demonstrates the unadjusted mean (SD) scores for SF-36 MCS, PCS and HRQOL domains of Black and White cancer patients. Compared with their White counterparts, Black patients had lower PCS, MCS, and all health domains of SF-36 with the exception of vitality. In addition, those aged ≥75 scored significantly lower than those <75 years in PCS (65–74, mean=39.7; ≥75, mean=35.2, t(13444)=21.6, P<.001) and MCS (65–74, mean= 52.4; ≥75 and older, mean=50.7, t(13444)=9.2, P<.001). Patients in the older group also scored significantly lower in all health domains (data not shown).

Table 3 presents regression coefficients and adjusted means of each SF-36 score among Black and White cancer patients. After adjusting for demographic features and medical conditions, the MCS scores of Black patients were still lower than that of White patients. However, the mean PCS was not different for Black and White patients. Black patients had significantly lower HRQOL in general health, social functioning, and role emotion, whereas they had a higher mean score in vitality.

Table 4 shows the information on the relative impact of each non-cancer comorbid condition and the interaction term of comorbid conditions and race on the PCS and MCS based on results of multivariable regression analyses. Only results that were statistically significant were reported in the table. All the medical conditions were associated with the PCS. Arthritis of the hip or knee and emphysema/asthma/COPD

Table 3. Multivariate analyses of race and SF-36 scores[a]

SF-36 scale	ß (SE)	Race		P
		Adjusted means (SE)		
		Black	White	
Physical functioning	−1.44 (.97)	54.4 (.94)	55.9 (.24)	.14
Role-physical	−.16 (1.51)	47.5 (1.46)	47.7 (.37)	.91
Bodily pain	−.85 (.85)	58.4 (.21)	59.3 (.82)	.32
General health	−3.26 (.75)	54.3 (.73)	57.6 (.18)	<.001
Vitality	3.06 (.77)	54.1 (.75)	51.5 (.19)	<.001
Social functioning	−2.49 (.98)	71.7 (.95)	74.1 (.24)	.01
Role-emotion	−5.86 (1.45)	66.6 (1.41)	72.5 (.35)	<.001
Mental health	.14 (.65)	75.6 (.63)	75.6 (.16)	.90
Physical component summary	−.20 (.40)	37.4 (.38)	37.6 (.10)	.61
Mental component summary	−.76 (.38)	50.1 (.37)	51.8 (.09)	.04

[a] Adjusted for demographic factors and comorbidities.
ß, regression coefficient; SE, standard error.

Table 4. The impact of comorbidities and the interaction term of race and comorbidities on PCS and MCS in HRQOL

	ß (SE)[a]	t	P
Physical Component Summary			
Comorbidities			
Hypertension	−1.32 (.20)	−6.59	<.001
Angina or coronary artery disease	−1.67 (.29)	−5.74	<.001
Congestive heart failure	−3.87 (.35)	−11.10	<.001
Heart attack	−.71 (.33)	−2.14	.03
Other heart conditions	−1.35 (.23)	−5.98	<.00
Stroke	−3.77 (.32)	−11.71	<.001
Emphysema, asthma, or COPD	−4.95 (.25)	−19.75	<.001
Crohn disease, ulcerative colitis, or irritable bowel disease	−1.37 (.39)	−3.55	<.001
Arthritis of the hip or knee	−5.63 (.21)	−26.70	<.001
Arthritis of the hand and wrist	−1.95 (.21)	−9.17	<.001
Sciatica	−2.70 (.23)	−11.99	<.001
Diabetes	−2.03 (.23)	−8.66	<.001
Comorbidities × race			
Congestive heart failure × race	−3.81 (1.45)	−2.64	.01
Stroke × race	−3.63 (1.19)	−3.05	.02
Mental Component Summary			
Comorbidities			
Angina or coronary artery disease	−.56 (.29)	−1.97	.049
Congestive heart failure	−1.79 (.34)	−5.30	<.001
Stroke	−3.39 (.31)	−10.84	<.001
Emphysema, asthma, or COPD	−1.91 (.24)	−7.85	<.001
Crohn disease, ulcerative colitis, or irritable bowel disease	−2.83 (.38)	−7.54	<.001
Arthritis of the hand or wrist	−1.41 (.21)	−6.81	<.001
Sciatica	−1.98 (.22)	−9.07	<.001
Diabetes	−.96 (.27)	−4.20	<.001
Comorbidities × race			
Stroke × race	−2.67 (1.16)	−2.31	.021
Arthritis of the hand or wrist × race	1.99 (.88)	2.25	.024

[a] Adjusted for demographic factors.
ß, regression coefficient; SE, standard error.

had the greatest impact on physical health. In addition, there were significant interaction effects of CHF and stroke by race. Both comorbidities were related to lower levels of the PCS for White patients (CHF: ß=−4.13, P<.001; stroke: ß=−1.85, P<.001), whereas there were no such relationships for Black patients.

Eight out of the twelve conditions were also related to the MCS, with gastrointestinal disorders and stroke having the strongest impact. Significant interaction effects were detected for stroke and arthritis of hand or wrist by race. Stoke was related to higher level of the MCS for White patients (ß=−3.62, P<.001), but not for Black patients.

Even though arthritis of the hand or wrist was significantly associated with decline in the MCS for both racial groups, the association was stronger for Black patients (ß =−3.38, P<.001) than for White patients (ß =−1.27, P<.001).

DISCUSSION

Understanding the potential consequences of racial differences in cancer outcomes, including quality of life is important for physicians and patients. Our study provided evidence on the link between race and HRQOL among elderly patients with cancer. The find-

ings showed significant demographic differences in our sample of Black and White respondents. Although Black patients were younger in general, they were more likely than Whites to be living with hypertension, stroke, diabetes, arthritic conditions and sciatica.

In our study, race had a significant impact on certain aspects of quality of life for older cancer patients. It was associated with two health summary scores and seven out of eight health domains in bivariate analyses. After controlling for major demographics and comorbid conditions, Black patients had lower HRQOL in three major health domains—general health, social functioning, and role emotion. These findings are similar to those in a previous study on racial differences in HRQOL outcomes among Black and White women breast cancer survivors, which showed that Black women reported lower general health and limitations in their roles due to emotional status.[19] The authors suggested that the impact of cancer could be greater as perceived by Black cancer patients or that there were other physical limitations that had not been explicitly measured.

Black patients had lower adjusted mean scores of the MCS, which is in contrast to some prior evidence that being Black is related to greater emotional well-being for cancer patients.[15,20] It has been suggested that Black individuals tend to be exposed to a greater

After controlling for major demographics and comorbid conditions, Black patients had lower HRQOL in three major health domains—general health, social functioning, and role emotion.

number of adverse life events, such as poverty and racial discrimination before being diagnosed with cancer, and such experiences may reduce the threat of cancer diagnosis or may make them better prepared to cope with the disease.[21] However, our finding indicated that it is also possible that these adverse life events, when combined with the burden of cancer, may lead to a worse emotional well-being. In general, Black patients tend to have more socioeconomic challenges. While many of these older patients are likely to receive Medicare, they and their families have to shoulder additional costs associated with a cancer diagnosis (eg, multiple doctor visits, increased number of medications and treatments) and are likely to experience the strain of the day-to-day reality of more dependent social roles, realization of having a feared disease, and a more pessimistic outlook regarding prognosis.[22] Future studies need to incorporate important psychosocial factors such as stress coping styles and social support in the assessment of the emotional aspect of quality of life.

The only health domain that Blacks scored higher than Whites was vitality. Fatigue is one of the most common side effects of cancer and its treatments.[23,24] Patients experiencing more than one type of treatments at the same time or one after the other usually experience more fatigue. People in the advanced stages of cancer are often characterized with exhaustion and total lack of energy.[24] Without data on tumor characteristics and treatment information, it is unclear whether and to what extent the racial difference in vitality in our study is linked to the stage of disease process or the intensity of cancer treatments.

Our study showed that non-cancer medical conditions were likely to lead to poorer QOL, which confirmed previous findings that greater comorbidity is associated with decreasing independent living, QOL, and the ultimate survival rate.[25–27] Comorbid illness is a significant concern in patients with cancer. In our study, most major non-cancer medical conditions were more prevalent among Black patients than White patients. Racial differences in comorbidities have been postulated as a main cause of racial disparities in cancer outcomes.[28] Our analyses showed that certain comorbidities interacted with race to predict HRQOL. Therefore, it is important for future studies to integrate comorbid illnesses into the cancer disparities research on the treatment decision and the overall cancer management.

Studies that assessed racial differences in HRQOL across various medical conditions have shown findings similar to ours, that older Black patients with cancer have lower HRQOL scores compared to older White patients with cancer. However, there is great complexity involved in making conclusions about the causes of these differences.[29–31] Various patient-, provider-, and system-level factors contribute to these differences. However, past reports have cited decreased quality of care, decreased access to care, and greater disability burden as factors that impact decreased health in Blacks across various medical conditions compared to Whites.[32,33] Available evidence suggested that compared to White patients, Black patients with cancer have more difficulties in obtaining health information, coordinating care, receiving psychosocial care.[34] Our findings, along with other previous investigations, highlight the need for further research into the interplay of personal, contextual, and socio-cultural factors in HRQOL of patients with cancer.

This study has some limitations. First, our study only included individuals who were beneficiaries of a Medicare managed care plan, which may limit the generalizability of the findings to the general population. Furthermore, our data did not allow us to differentiate the type of cancer. Cancer-specific differences in HRQOL have been noted in other studies; patients with bladder or kidney cancer or non-hodgkin lymphoma have a larger decrease in mental health scores after cancer diagnosis than patients with prostate cancer.[27] Therefore, to what extent our research can reflect the actual racial disparities in HRQOL is affected by the prevalence of specific cancer. Other limitations include lack of clinical details of the cancer diagnosis and treatment, insufficient patient personal information (eg, income), and use of self-reported data to identify cancer patients and assess comorbidity.

The quality-of-life issues, including main predictive factors of HRQOL, are important for oncologist, nurses and other caregivers in offering optimal care to cancer patients and their families. Our findings reveal the association between HRQOL and race and other important demographic and medical factors. In particular, the effect of race on quality of life was likely to be moderated by comorbid conditions. The results have implications for developing clinical guidelines and health policies. To optimize cancer outcomes at the population level, it is critical to identify subgroups with an increased risk of low QOL and to develop appropriate supportive and preventive interventions for cancer patients. The care of non-physical aspects of cancer should be seen as a part of cancer management.

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