



Original Article

Do older adult cancer survivors experience worse health-related quality of life in comparison to middle-aged cancer survivors? A secondary data analysis of the 2014 behavioral risk factor surveillance study

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ABSTRACT

Objectives: The primary aim of this paper was to examine the potential differences in health-related quality of life (HRQOL) between middle-aged (45–64 years old) and older adult (65 years and older) cancer survivors utilizing the contextual model of health-related quality of life.

Material and Methods: The author conducted a secondary data analysis of the 2014 behavioral risk factor surveillance system cancer survivorship module survey. Only respondents age 45 and older were included, resulting in $n = 5656$.

Results: Older adult cancer survivors reported significantly better physical and mental HRQOL than middle-aged cancer survivors. In regard to physical HRQOL, respondents who were older adults, employed, completed treatment, and exercised recently were more likely to report good physical HRQOL. Respondents with comorbid conditions and those with greater years since diagnosis were more likely to report poor HRQOL. In regard to mental HRQOL, respondents who were older, married, or had completed treatment were more likely to have good mental HRQOL. Respondents who were unemployed, had experienced financial cost as a barrier to care, had stroke or chronic obstructive pulmonary disorder, or a history of depression were more likely to report poor mental HRQOL.

Conclusion: Older adult cancer survivors experience better mental and physical HRQOL compared to their middle-aged counterparts. Efforts to improve HRQOL in cancer survivors should include middle-aged adults as well as cancer survivors who are unmarried, still in treatment, or have comorbidities. Greater research is needed to better understand how age differentially affects HRQOL in persons with a cancer history.

Keywords: Health-related quality of life, Cancer survivors, Older adults, Middle aged

INTRODUCTION

Cancer is primarily a disease of aging, with a majority of cancer diagnoses and deaths occurring in adults over the age of 65.^[1] Today, 62% of cancer survivors in the U.S. are age 65 years or older. In just 20 years, this proportion will climb to 73%, and older adult cancer survivors will number over 19 million.^[2] This growth in the older adult cancer survivor population warrants further inquiry into the impact of cancer on older adults' health outcomes.

Cancer frequently brings about chronic pain, fatigue, and decreases in performing occupational activities.^[3-6] For instance, individuals diagnosed with prostate cancer have cited complications

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with sexual functioning; and those with colorectal cancer have reported struggling with bowel and urinary incontinence.^[3,6,7] Cancer survivors also report increased anxiety, depression, and intense fears about cancer recurrence.^[5,8-10] These health challenges may be further exacerbated in older adults, who must also contend with many age-related health problems, such as declines in sensory function, restrictions in physical mobility, and increases in chronic disease development.^[11-15] Despite these reports, little is known about older adult cancer survivors' health-related quality of life (HRQOL) and how this might compare with the HRQOL of cancer survivors who are in middle age (45–64 years old).

HRQOL is a subjective assessment of the impact of a disease on an individual's quality of life, particularly the extent to which the disease interferes with one's physical and mental functioning.^[16] It is an important endpoint in clinical cancer care and provides the medical team with a meaningful comparison of a patient's well-being in relation to the non-cancer population.^[17,18] Existing research on the effect of age on HRQOL outcomes in older cancer survivors has reported mixed findings. For instance, while some studies reported that older adult cancer survivors had a higher risk of psychological distress than middle-aged survivors,^[19,20] other studies have reported the opposite or no relationship between age group and psychological distress.^[21-25] One difficulty with understanding how age impacts HRQOL in cancer survivors is that a vast majority of HRQOL studies focus on breast or prostate cancer survivors, which are highly treatable.^[26] In addition, many HRQOL studies are drawn from convenience samples, such as a particular hospital or survivor support group, and are not representative of the population.

The current study will add to the literature by examining the physical and mental HRQOL of adult cancer survivors of multiple cancer sites using a population-based sample from the Behavioral Risk Factor Surveillance Study (BRFSS).^[27] We hypothesize that the age group (middle age vs. older age) will be associated with physical and mental HRQOL, such that older adults will report worse HRQOL outcomes than their middle-aged counterparts.

Conceptual framework

To examine predictors of HRQOL, this study utilized the contextual model of HRQOL as shown in Figure 1,^[28,29] which posits that HRQOL is influenced by the macro-systemic domain, which comprises: (a) *Demographics*, such as age and gender; (b) *cultural context*, such as ethnicity; (c) *socioecological factors*, such as income, education, and employment; and (d) health-care system factors, such as health insurance status. HRQOL is also posited to be influenced by the micro-individual domain, which consists of: (1) *General health*, such as disease status and comorbidities; (2) *cancer-related factors*, such as cancer stage

and treatment type; (3) *psychological well-being*, such as depression; and (4) *health efficacy*, such as health practices and medical adherence.

MATERIAL AND METHODS

Data for this study were drawn from the 2014 wave of BRFSS, a cross-sectional survey conducted annually in the United States about health behaviors and conditions. The data analytic sample for this study included participants age 45 years and older who reported ever having had a cancer diagnosis and who completed the cancer survivorship questionnaire ($n = 5656$). This study was approved by the Institutional Review Board of Columbia University.

Measures

HRQOL

The dependent variables in this study, physical and mental HRQOL, were assessed using healthy days, a 3-item validated measure.^[30-34] For the physical HRQOL, participants were asked: "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?" For mental HRQOL, participants were asked, "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" Responses on the survey were captured using a continuous, whole number equal to the number of days (0–30). Distributions for the dependent variables were found to be highly skewed toward zero in the current sample (which is similar to other studies).^[31,33-35] Thus, our dependent variables were dichotomized as 0 and 1, where 0 represented good HRQOL and 1 represented poor HRQOL.

Independent variables

Demographic factors included age (middle aged/older adult); gender (male/female), marital status (married/not married), gender (male/female), and race (non-Hispanic White or racial/ethnic minority). Socioecological factors consisted of income level (<\$20,000; \$20,000–<\$50,000; or ≥\$50,000), education level (high school or less, some college or a 2-year degree, or 4-year college degree or higher), and employment status (unemployed, employed full time, or retired). For general health factors, individuals' report of having had any of the following common comorbidities was measured (no/yes): Heart attack, coronary heart disease, stroke, asthma, chronic obstructive pulmonary disease, arthritis, kidney disease, or diabetes. Cancer-related factors included cancer type (breast, gynecologic, head/neck, gastrointestinal, leukemia/lymphoma, male reproductive, skin, lung, urinary,

or other), treatment status (completed/not completed), and time since diagnosis. The psychological well-being factor included respondents' self-report of a history of depressive disorders (no/yes). The health efficacy factors consisted of smoking history (no/yes), exercise in the past month (no/yes), and time since last routine checkup (within the past year, 1–5 years, ≥ 5 years).

Data analysis

Descriptive statistics were conducted for all independent variables; first, for the total sample and then by age group. Bivariate regressions were conducted to assess potential associations between independent variables and each HRQOL outcome. Hierarchical multiple logistic regressions were then conducted to examine relationships between independent variables and outcomes using the contextual model as a guide. First, macro-systemic factors were entered in blocks (demographics, cultural context, socioecological, and then health-care access) followed by micro-individual factors (general health, cancer-related factors, psychological well-being, and then health efficacy). The log-likelihood statistic was used to assess each model's goodness of fit. All data were analyzed using SAS Proc Survey commands to account for the complex survey design. Stratification, cluster, and weight functions were conducted using codes provided by BRFSS. Significance testing was assessed at $P < 0.05$ using Wald χ^2 .

RESULTS

Descriptive statistics

As shown in [Table 1], the mean age of the study sample was 63 years old. In comparison to the older adult group, the middle-aged group had a higher percentage of females (65% vs. 53%; $P < 0.0001$) and married participants (62% vs. 53%; $P < 0.01$). The racial/ethnic composition of the sample did not differ between age groups. More middle-aged survivors had incomes $\geq \$50,000$ (43% vs. 25%; $P < 0.0001$), held college degrees (23% vs. 18%; $P < 0.0001$), and were employed (51% vs. 12%; $P < 0.0001$). In terms of health-care access, more middle-aged survivors reported that cost had stopped them from receiving treatment (15% vs. 5%; $P < 0.0001$) and were uninsured than older adult survivors (7% vs. 1%; $P < 0.0001$).

As shown in [Table 2], a higher percentage of older adult survivors reported having had a heart attack (15% vs. 6%, $P < 0.0001$), coronary heart disease (15% vs. 6%, $P < 0.0001$), stroke (11% vs. 6%, $P < 0.001$), arthritis (58% vs. 47%, $P < 0.0001$), kidney disease (10% vs. 5%; $P < 0.01$), or diabetes (25% vs. 19%; $P < 0.05$) than middle-aged survivors. In regard to cancer-related factors, more middle-aged survivors reported gynecological (17% vs. 7%, $P < 0.0001$)

and head-and-neck cancers (8% vs. 3%, $P < 0.0001$) than older adult survivors. Older adult survivors reported greater proportions of male reproductive (22% vs. 12%, $P < 0.001$) and urinary (6% vs. 4%, $P < 0.05$) cancers than middle-aged survivors. Frequency of cancers of the breast, gastrointestinal system, blood, skin, lung, or other sites did not vary by age group. Most of the participants had completed treatment (76%), and this did not vary between age groups. The mean years since diagnosis for the entire sample was 11.5, with middle-aged survivors reporting an average of 10.7 years and older adult survivors reporting 12.9 years ($P < 0.0001$).

More middle-aged survivors reported depression than older adults (32% vs. 17%; $P < 0.0001$). More than half of the sample reported a history of smoking (54%), and this did not vary between age groups. More middle-aged survivors reported exercising than older survivors (70 vs. 62%; $P < 0.01$). On the other hand, more older survivors had completed an annual check-up within the last year (91% vs. 80%, $P < 0.0001$).

Hierarchical multiple logistic regressions

Physical HRQOL

The full model [Table 3] indicated that older age (O.R. = 1.726, $P < 0.01$), being employed (O.R. = 2.354, $P < 0.001$), having been diagnosed with skin cancer (O.R. = 2.426, $P < 0.05$), having completed cancer treatment (O.R. = 1.418, $P < 0.05$), and exercising (O.R. = 1.669, $P < 0.001$) increased the odds of reporting good physical HRQOL. Comorbid factors that were associated with poor physical HRQOL included having coronary heart disease (O.R. = 0.542, $P < 0.01$), stroke (O.R. = 0.574, $P < 0.05$), asthma (O.R. = 0.548, $P < 0.01$), arthritis (O.R. = 0.533, $P < 0.0001$), and kidney disease (O.R. = 0.411, $P < 0.01$).

Mental HRQOL

The full model [Table 4] indicated that being older (O.R. = 2.654, $P < 0.0001$), married (O.R. = 1.516, $P < 0.05$), retired (O.R. = 1.782, $P < 0.05$), and finished with treatment (O.R. = 1.904, $P < 0.001$) were related to good mental HRQOL. On the other hand, having experienced financial cost as a barrier to receiving care (O.R. = 0.495, $P < 0.01$), a stroke (O.R. = 0.552, $P < 0.05$), COPD (O.R. = 0.588, $P < 0.05$), skin cancer (O.R. = 0.406, $P < 0.05$), or a history of depression (O.R. = 0.207, $P < 0.0001$) significantly predicted poor mental HRQOL.

DISCUSSION

Findings from this study revealed that older adult cancer survivors reported better HRQOL than middle-aged survivors. This finding comes as a surprise, given that declines in physical functioning tend to occur with increasing age.^[12,36]

Table 1: Macro-systemic characteristics of the sample by age group.

	All ages (n=5656)		Age 45–64 (n=1810)		Age ≥65 (n=3846)	
	Unweighted frequency	(Weighted %)	Unweighted frequency	(Weighted %)	Unweighted frequency	(Weighted %)
Demographics						
Age						
Mean	63					
Gender****						
Male	1893	(42)	511	(35)	1382	(47)
Female	3409	(58)	1203	(65)	2206	(53)
Marital status**						
Unmarried	2563	(43)	677	(38)	1886	(47)
Married	2707	(56)	1026	(62)	1681	(53)
Race						
Non-Hispanic White	4880	(90)	1546	(90)	3334	(90)
Ethnic minority	378	(10)	152	(10)	226	(10)
Socioecological factors						
Income level****						
<\$20,000	1009	(23)	337	(24)	672	(23)
\$20,000–\$50,000	2004	(44)	501	(33)	1503	(52)
\$50,000 or more	1461	(33)	685	(43)	776	(25)
Education****						
High school or less	2400	(50)	625	(42)	1775	(56)
Some college/2-year degree	1439	(30)	547	(35)	892	(26)
4-year college degree or higher	1429	(20)	536	(23)	893	(18)
Employment status****						
Unemployed	958	(22)	519	(33)	439	(13)
Employed	1390	(27)	926	(51)	464	(12)
Retired	2911	(51)	263	(16)	2648	(75)
Health-care system						
Health insurance****						
No	153	(3)	122	(7)	31	(1)
Yes	5136	(97)	1587	(93)	3549	(99)
Usual source of care						
No	260	(5)	121	(6)	139	(5)
Yes (one or more)	5023	(95)	1586	(94)	3437	(95)
Cost posed a barrier to care****						
No	4928	(91)	1484	(84)	3444	(95)
Yes	370	(9)	229	(15)	141	(5)

*P<0.05, **P<0.01, ***P<0.001, ****P<0.0001

However, it is in line with the previous findings.^[8,21,22] One explanation could be that a cancer diagnosis presents a greater threat or life interruption for middle-aged survivors, who are typically still working and raising a family; unlike older survivors, who might perceive cancer as yet another “bump in the road.”^[37]

The current study also suggests that being married improves mental HRQOL. This could be due to social support and caregiving benefits received from spouses following a cancer diagnosis. The extant literature supports this notion with studies finding that married cancer patients were up to 20% less likely to die from cancer than unmarried cancer patients.^[38-41] These findings highlight the importance of

marital support in improving survivorship outcomes and the need to focus greater attention on survivors who do not have a spouse.

The present study also found that experiencing financial cost as a barrier to care was a predictor of poor mental HRQOL, echoing that of the literature.^[42-44] This could indicate that concerns over ability to afford health care take a great toll on cancer survivors’ mental HRQOL. Indeed, studies have found that survivors who faced financial barriers to care were more likely to experience depression and increased worry about cancer recurrence.^[42-44] Thus, efforts to improve HRQOL in cancer survivors should focus on removing financial barriers to care.

Table 2: Micro-individual level characteristics of the sample by age group.

	All ages		Age 45–64		Age≥65	
	Unweighted frequency	(Weighted %)	Unweighted frequency	(Weighted %)	Unweighted frequency	(Weighted %)
General health						
Comorbidities						
Heart attack****						
No	4671	(88)	1591	(94)	3080	(85)
Yes	599	(12)	116	(6)	483	(15)
Coronary heart disease****						
No	4604	(89)	1571	(94)	3033	(85)
Yes	617	(12)	129	(6)	488	(15)
Stroke***						
No	4862	(91)	1603	(94)	3259	(89)
Yes	425	(9)	106	(6)	319	(11)
Asthma***						
No	4542	(86)	1405	(82)	3137	(88)
Yes	739	(14)	302	(18)	437	(12)
COPD						
No	4511	(86)	1462	(87)	3049	(85)
Yes	758	(14)	246	(13)	512	(15)
Arthritis****						
No	2369	(46)	915	(53)	1454	(42)
Yes	2905	(54)	792	(47)	2113	(58)
Kidney**						
No	4853	(92)	1587	(95)	3266	(90)
Yes	408	(8)	113	(5)	295	(10)
Diabetes*						
No	4176	(77)	1398	(81)	2778	(75)
Yes	1120	(23)	314	(19)	806	(25)
Cancer-related factors						
Cancer type						
Breast	1317	(24)	423	(24)	894	(23)
Gynecological****	578	(11)	284	(17)	294	(7)
Head and neck****	235	(5)	121	(8)	114	(3)
Gastrointestinal	477	(11)	125	(9)	352	(12)
Blood	222	(4)	72	(5)	150	(4)
Male reproductive***	705	(18)	157	(12)	548	(22)
Skin**	493	(11)	90	(7)	403	(13)
Lung	159	(3)	47	(4)	112	(3)
Urinary*	256	(5)	73	(4)	183	(6)
Other	332	(8)	147	(10)	185	(7)
Treatment status						
Treatment not completed	1053	(24)	345	(24)	708	(24)
Treatment completed	3754	(76)	1190	(76)	2564	(76)
Time since diagnosis****						
Mean years (S.E.) ^a	11.5	(.27)	10.7	(.45)	12.9	(.37)
Psychological well-being						
History of depressive disorders****						
No	4143	(77)	1186	(68)	2957	(83)
Yes	1140	(23)	521	(32)	619	(17)
Health efficacy						
Smoking history						
Never smoked	2553	(46)	828	(49)	1725	(44)
Smokes currently or before	2602	(54)	830	(51)	1772	(56)
Exercise**						
No	1789	(34)	521	(30)	1268	(38)
Yes	3502	(66)	1191	(70)	2311	(62)
Annual checkups****						
More than a year ago	745	(13)	354	(20)	391	(9)
Within the past year	4458	(87)	1331	(80)	3127	(91)

*P<0.05, **P<0.01, ***P<0.001, ****P<0.0001. ^at-test was used

Table 3: Results of hierarchical logistic regression of physical HRQOL.

	O.R.	(C.I.)
Demographics		
Older age	1.726	(1.195, 2.492)**
Female	0.903	(0.604, 1.351)
Married	1.121	(0.824, 1.526)
Racial/ethnic minority	1.016	(0.548, 1.883)
Socioecological		
Income: \$20,000–\$50,000	1.185	(0.774, 1.814)
\$50,000 or more	1.167	(0.699, 1.949)
Education: Some college/2-year degree	0.95	(0.692, 1.303)
4-year college degree or higher	1.047	(0.735, 1.491)
Employment: Employed	2.354	(1.461, 3.793)***
Retired	1.453	(0.943, 2.240)
Health-care system		
Has health insurance	0.882	(0.401, 1.941)
Has one or more usual source of care	1.58	(0.813, 3.070)
Experienced cost as a barrier to care	0.673	(0.376, 1.206)
General health		
Heart attack	0.741	(0.447, 1.227)
Coronary heart disease	0.542	(0.342, 0.858)**
Stroke	0.574	(0.338, 0.977)*
Asthma	0.548	(0.357, 0.839)**
COPD	0.666	(0.424, 1.044)
Arthritis	0.533	(0.400, 0.710)****
Kidney	0.411	(0.239, 0.707)**
Diabetes	0.789	(0.554, 1.122)
Cancer-related factors		
Breast cancer	2.17	(0.978, 4.815)
Gynecological cancer	1.433	(0.604, 3.403)
Head-and-neck cancer	1.51	(0.589, 3.869)
Gastrointestinal cancer	1.179	(0.510, 2.728)
Blood cancer	1.542	(0.625, 3.800)
Male reproductive cancer	1.48	(0.652, 3.356)
Skin cancer	2.426	(1.049, 5.614)*
Lung cancer	0.608	(0.166, 2.226)
Urinary cancer	2.215	(0.912, 5.381)
Other cancer	1.591	(0.675, 3.750)
Treatment completed	1.418	(1.020, 1.971)*
Years since diagnosis	0.988	(0.977, 1.000)*
Psychological well-being		
History of depression	0.717	(0.512, 1.005)
Health efficacy		
Smokes currently or before	1.103	(0.834, 1.459)
Exercise	1.669	(1.254, 2.221)***
Had annual checkup within the past year	1.32	(0.916, 1.902)
Model fit		
LRT: 204,521.31		
P<0.0001		

*P<0.05, **P<0.01, ***P<0.001, ****P<0.0001

Table 4: Results of hierarchical logistic regression of mental HRQOL.

	O.R.	(C.I.)
Demographics		
Older age	2.654	(1.770, 3.979)****
Female	0.812	(0.531, 1.239)
Married	1.516	(1.085, 2.118)*
Racial/ethnic minority	0.749	(0.429, 1.305)
Socioecological		
Income: \$20,000–\$50,000	0.756	(0.471, 1.215)
\$50,000 or more	1.335	(0.758, 2.352)
Education: Some college/2-year degree	1.191	(0.820, 1.728)
4-year college degree or higher	0.972	(0.635, 1.488)
Employment: Employed	1.5	(0.939, 2.396)
Retired	1.782	(1.101, 2.882)*
Health-care system		
Has health insurance	1	(0.440, 2.271)
Has one or more usual source of care	1.034	(0.470, 2.272)
Experienced cost as a barrier to care	0.495	(0.297, 0.824)**
General health		
Heart attack	0.992	(0.563, 1.748)
Coronary heart disease	0.722	(0.430, 1.211)
Stroke	0.552	(0.308, 0.990)*
Asthma	0.724	(0.453, 1.155)
COPD	0.588	(0.382, 0.904)*
Arthritis	0.935	(0.677, 1.291)
Kidney	0.748	(0.454, 1.235)
Diabetes	1.446	(0.981, 2.133)
Cancer-related factors		
Breast cancer	0.578	(0.248, 1.344)
Gynecological cancer	0.854	(0.344, 2.122)
Head-and-neck cancer	1.06	(0.382, 2.945)
Gastrointestinal cancer	0.665	(0.271, 1.633)
Blood cancer	0.462	(0.158, 1.348)
Male reproductive cancer	0.454	(0.183, 1.125)
Skin cancer	0.406	(0.168, 0.981)*
Lung cancer	0.893	(0.309, 2.585)
Urinary cancer	0.824	(0.328, 2.072)
Other cancer	0.475	(0.188, 1.201)
Treatment completed	1.904	(1.332, 2.721)***
Years since diagnosis	0.989	(0.975, 1.003)
Psychological well-being		
History of depression	0.207	(0.148, 0.289)****
Health efficacy		
Smokes currently or before	1.406	(1.018, 1.941)*
Exercise	1.202	(0.870, 1.661)
Had annual checkup within past year	1.168	(0.774, 1.761)
Model fit		
LRT: 259,105.5		
P<0.0001		

finding was not surprising, as research with non-cancer populations has shown stroke lowers functioning and quality of life.^[45,46] Even 15 years after experiencing a stroke, 39%

In addition, having a stroke history was found to detrimentally affect physical and mental HRQOL. This

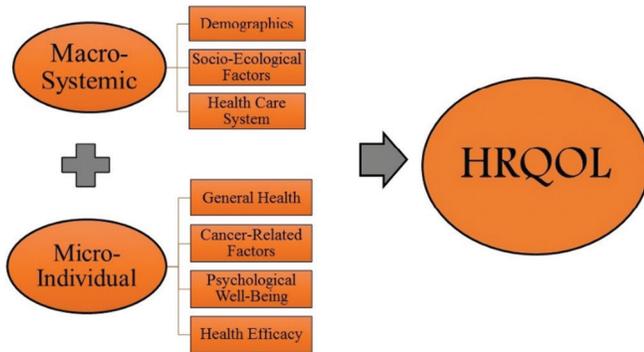


Figure 1: Contextual model of health-related quality of life.

of respondents were depressed and 63% had some form of physical disability.^[45] This underscores the importance of including comorbid conditions, especially stroke, when considering efforts to improve HRQOL.

Having completed treatment was found to be a significant predictor of better physical and mental HRQOL. This finding is expected, as research consistently has documented the positive relationship between treatment completion and survival.^[47,48] Patients still in treatment have frequently reported pain, fatigue, and loss of memory and motor functions, all of which can contribute to a poorer HRQOL.^[3-6] Thus, interventions should be developed to help patients complete timely treatment.

In the present study, having a history of depression was associated with poor mental HRQOL. This is not surprising, given that the literature largely documents strong links between depression and worse mental HRQOL in cancer survivors.^[5,8-10] Rieke *et al.*^[49] showed that among older head-and-neck cancer patients, those with pre-cancer depression were 49% more likely to die from their cancer, while those diagnosed with depression after their cancer were 38% more likely to die from their cancer compared to patients without depression. These reports warrant greater efforts for combating the debilitating effect of cancer on mental HRQOL.

Finally, the current study also found that preventive health behaviors, such as exercising and not smoking, were predictors of better HRQOL – findings that are also in line with the literature.^[50,51] These reports underscore the importance of promoting healthy behaviors in cancer survivors to enhance HRQOL.

Limitations

The present study is subject to a number of limitations. First, the cross-sectional nature of this study prevents drawing any conclusions about causality or understanding how relationships between independent variables and HRQOL might vary at different points in time. Second, BRFSS data were collected by telephone survey and may not be

representative of people who do not own or use a telephone. Furthermore, BRFSS only surveys individuals who are from the non-institutionalized, civilian population; and these results might not be generalizable to cancer survivors who are in nursing homes, inpatient hospice care, or otherwise institutionalized. Fourth, the data included in this study rely on self-report; therefore, cancer-related and other medical information might not be accurate. Fourth, data are limited to respondents who completed the cancer survivorship module in certain states; thus, the generalizability of this study is limited to these areas.

CONCLUSION

Despite these limitations, this study has several important implications. Middle-aged cancer survivors should be targeted in efforts to improve HRQOL. In addition, cancer survivors who are unmarried, experienced cost as a barrier to care, have physical comorbidities, or a history of depression should be included in interventions to improve HRQOL. Special attention should be paid to cancer survivors who have had a stroke, as they could be at greater risk of poor HRQOL. Greater effort needs to be made to reach individuals who have difficulty adhering to treatment. Overall, the findings from this study indicate that contextual factors influence middle-aged and older adult cancer survivors' HRQOL.

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Declaration of patient consent

Patient's consent is not required as patient's identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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