

Discussions of Cancer Survivorship Care Needs Are There Rural Versus Urban Inequities?

Tyrone F. Borders, PhD* and Lindsey Hammerslag, PhD†

Background: Rural cancer survivors may face greater challenges receiving survivorship care than urban cancer survivors.

Purpose: To test for rural versus urban inequities and identify other correlates of discussions about cancer survivorship care with healthcare professionals.

Methods: Data are from the 2017 Medical Expenditure Panel Survey (MEPS), which included a cancer survivorship supplement. Adult survivors were asked if they discussed with a healthcare professional 5 components of survivorship care: need for follow-up services, lifestyle/health recommendations, emotional/social needs, long-term side effects, and a summary of treatments received. The Behavioral Model of Health Services guided the inclusion of predisposing, enabling, and need factors in ordered logit regression models of each survivorship care variable.

Results: A significantly lower proportion of rural than urban survivors (42% rural, 52% urban) discussed in detail the treatments they received, but this difference did not persist in the multivariable model. Although 69% of rural and 70% of urban survivors discussed in detail their follow-up care needs, less than 50% of both rural and urban survivors discussed in detail other dimensions of survivorship care. Non-Hispanic Black race/ethnicity and time since treatment were associated with lower odds of discussing 3 or more dimensions of survivorship care.

Conclusions: This study found only a single rural/urban difference in discussions about survivorship care. With the exception of discussions about the need for follow-up care, rates of discussing in detail other dimensions of survivorship care were low among rural and urban survivors alike.

Key Words: Cancer, follow-up care, rural, inequities, survivorship

(*Med Care* 2024;62:473–480)

Although just 13.8% of all US residents live in a rural county,¹ they bear an unbalanced proportion of the cancer burden. They have significantly higher cancer incidence and death rates for many cancer types and all cancer types pooled together.² Many rural residents diagnosed with cancer encounter challenges accessing treatment³ because of lower availabilities of oncologists in rural areas,⁴ longer travel times to cancer treatment centers,^{5,6} or difficulties coordinating care with local primary care professionals.⁷

Once cancer treatment ceases, cancer survivors need continued clinical care to monitor cancer recurrence, detect new cancers, and monitor for treatment side effects.^{8,9} The American Society of Clinical Oncology (ASCO),¹⁰ the National Comprehensive Cancer Network,¹¹ and the American Cancer Society (ACS)¹² have developed survivorship care guidelines, and adherence to survivorship recommendations has been shown to be positively associated with health outcomes.¹³ Discussions between survivors and healthcare professionals about survivors' posttreatment needs are arguably a key step to assuring the receipt of recommended cancer services. Furthermore, survivors who discuss in detail with a healthcare provider their emotional or social needs are less likely to report symptoms of depression and more likely to report positive attitudes toward cancer.¹⁴

Rural cancer patients' inequities persist when transitioning into the survivorship period, as they have worse health outcomes compared with survivors residing in urban areas.¹⁵ One nationally representative study found that greater proportions of rural cancer survivors have poorer self-rated health, greater psychological distress, and multiple noncancer comorbidities than urban survivors.¹⁵ A study conducted in Kentucky also found that rural survivors have poorer mental health than urban survivors.¹⁶ Compounding their poorer health outcomes, rural survivors nationally are

From the *College of Nursing, University of Kentucky, Lexington, KY; and †Division of Biomedical Informatics, Department of Internal Medicine, College of Medicine, University of Kentucky, Lexington, KY. The authors declare no conflict of interest.

This project was supported by the Federal Office of Rural Health Policy (FORHP), the Health ReSources and Services Administration (HRSA), the US Department of Health and Human Services (HHS) under cooperative agreement number U1CRH30041. The information, conclusions and opinions expressed in this document are those of the authors and no endorsement by FORHP, HRSA, HHS, or the University of Kentucky is intended or should be inferred.

Correspondence to: Tyrone F. Borders, PhD, Healthy Kentucky Research Building, University of Kentucky, 760 Press Avenue, Lexington, KY 40508. E-mail: ty.borders@uky.edu.

Supplemental Digital Content is available for this article. Direct URL citations are provided in the HTML and PDF versions of this article on the journal's website, www.lww-medicalcare.com.

Copyright © 2024 The Author(s). Published by Wolters Kluwer Health, Inc. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

DOI: 10.1097/MLR.0000000000002014

more likely to experience financial adversity because of their cancer.¹⁷

Improved survivorship care could ameliorate rural versus urban disparities in cancer survivorship outcomes, but very little research has examined rural versus urban differences in discussions about survivorship care. One prior study based on the 2011 Medical Expenditure Panel Survey (MEPS) found no rural/urban difference in cancer survivors' discussions with healthcare providers about the need for follow-up care,¹⁸ but this study did not investigate discussions of other dimensions of survivorship care, such as healthy lifestyle recommendations, emotional or social needs, side effects, or treatment summaries.

This study's overall objective was to test for rural versus urban inequities in cancer survivors' discussions of survivorship care needs with their health care professionals. Given prior research documenting that rural residents frequently encounter difficulties accessing cancer treatment,³ we hypothesized that rural cancer survivors would have lower odds of discussing in greater detail key components of survivorship care: the need for follow-up services after completing treatment, lifestyle and health recommendations, emotional/social needs, long-term side effects, and a summary of treatments received. A secondary objective was to identify other predisposing, enabling, and need factors associated with discussions about survivorship care.

METHODS

Study Design and Sample

The study design is cross-sectional and involves analyses of data from the 2017 Medical Expenditure Panel Survey (MEPS), which is the latest MEPS to include a cancer survivor module.^{19,20} The MEPS is sponsored by the US Agency for Healthcare Research and Quality (AHRQ) and is the federal government's most thorough nationally representative survey of health services access among the civilian, noninstitutionalized population.¹⁹ MEPS participants are sampled from the National Health Interview Survey (NHIS) participants and complete a series of interviews.²⁰

This study used data from 2 MEPS sources: the MEPS Household Component and the MEPS Experiences with Cancer Survivorship Supplement. The MEPS Household Component includes information on demographic, social, economic, health, and healthcare utilization characteristics. In 2011, 2016, and 2017, the MEPS also included the Experiences with Cancer Survivorship Supplement, which was collaboratively developed by experts from the National Cancer Institute (NCI), ACS, Centers for Disease Control and Prevention (CDC), and AHRQ.²⁰ A sample of adult cancer survivors participating in the MEPS completed a self-administered questionnaire that assessed cancer-related psychological and financial burdens, long-lasting effects of treatment and cancer itself, effects on the employment of both survivors and their families, and survivors' experiences discussing with healthcare professionals their survivorship care needs. The unweighted sample size for the Cancer Survivorship Sup-

plement is 718 and the weighted sample size is 19,541,149. For the analyses presented in this article, persons whose only type of cancer was nonmelanoma skin cancer were excluded from analysis. When excluding these cases, the unweighted sample size is 569 and the analytical weighted sample size is 14,934,093 (2,542,041 rural and 12,392,052 urban).

Conceptual Framework

Andersen and Aday's well-established Behavioral Model of Health Services^{21,22} was applied to examine how individual-level predisposing, enabling, and need factors were associated with discussions about survivorship care. The Behavioral Model has been applied in numerous studies of adult cancer survivors' health services use²³ and racial/ethnic disparities in adult cancer survivors' delays in medical care.²⁴ More broadly, it has been applied in multiple investigations of rural versus urban disparities in healthcare access and outcomes.^{25–28}

Dependent Variables

Five separate items from the MEPS Cancer Survivorship Supplement serve as separate dependent variables. Participants were asked, "Since you were diagnosed, did any healthcare provider discuss with you..." the following:

1. The need for regular follow-up care and monitoring even after completing your treatment?
2. Lifestyle or health recommendations such as diet, exercise, or quitting smoking?
3. Your emotional or social needs related to your cancer, its treatment, or the lasting side effects of that treatment?
4. Late or long-term side effects of treatment you may experience over time?
5. A summary of all the cancer treatments you received?

Response options to each of the above questions were: (1) discussed it with me in detail; (2) briefly discussed it with me; (3) did not discuss it at all; and (4) I don't remember. We combined "did not discuss it at all" and "I don't remember responses," similar to a technique used in prior research.²⁹ The rationale for this approach is that persons who definitively recall engaging in discussion with a provider are more likely to actually adhere to the provider's survivorship care recommendations.

Independent Variables

US Office of Management and Budget designations of nonmetropolitan and metropolitan counties served as rural and urban classifications, respectively.³⁰ Because the publicly available MEPS dataset does not include a rural/urban variable, the authors obtained from AHRQ a restricted use dataset that was analyzed at the US Census Bureau Research Data Center (RDC) located at the investigators' university. Other predisposing variables included the survivors' age, gender, and race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, or non-Hispanic other). Enabling factors were marital status (never married, married, widowed, or divorced/separated), highest educational attainment (less than high school, high

school, college, or graduate school/other), family income as a percentage of the federal poverty level (poor, or <100%; low, or 100% to 200%; middle, or 200% to 400%; and high, or ≥400%), health insurance coverage (any private insurance, only public insurance, or uninsured during the year), and whether the respondent had a usual source of healthcare. Need factors included the years since cancer treatment (currently in treatment or <1 y, 1–3 y, 3–5 y, 5–10 y, 10–20 y, or ≥20 y since treatment; never treated; and unknown) and the number of comorbid conditions (0–1, 2–3, or 4 or more). For each variable, values of “not ascertained,” “don’t know,” “inapplicable,” or “refused” were coded as missing.

Analysis

We conducted t-tests and chi-square tests to compare continuous and categorical variables across rural/urban residence. We then conducted ordered logit regression analyses using ordinal-dependent variables (1 = discussed it with me in detail, 2 = briefly discussed it with me, and 3 = did not discuss it at all or I don’t remember). To provide a supplemental and simpler portrayal of the relationships, we also conducted logit regression analyses using binary dependent variables (discussed with me in detail/briefly discussed it with me vs. did not discuss it at all/don’t remember), an approach which was used in another study.¹⁸ We originally included cancer types/sites (breast, colon, melanoma, non-melanoma skin, prostate, and other cancer) as independent variables in the analyses, but removed them from the final models because variance inflation factors indicated excessive multicollinearity. The models reported in the article therefore exclude cancer types/sites. All analyses were conducted with SAS survey procedures (SAS Institute, Cary, NC) to yield weighted estimates adjusting for the MEPS sampling scheme.³¹

RESULTS

Sample Characteristics by Rural/Urban Residence

Table 1 shows that the sample characteristics did not differ significantly by rural/urban status. Regarding predisposing characteristics, both the rural and urban samples were ~64 years of age, had slightly higher percentages of females than males, and were predominantly non-Hispanic White. Regarding enabling factors, the majority of the rural and urban samples were married, well educated (only 20% of rural and 11% of urban had less than a high school degree), had middle or high incomes, and had a usual source of care. Regarding the need factors, the time since cancer treatment ended ranged from currently in treatment to more than 20 years since treatment, and the majority of rural and urban survivors had 4 or more comorbid conditions.

Survivorship Care Discussions by Urban/Rural Residence

Table 2 shows that one of the 5 dimensions of survivorship care discussions differed significantly by

TABLE 1. Weighted Descriptive Statistics by Rural/Urban Residence

Variable	Rural	Urban	P
<i>Predisposing factors</i>			
Age, mean (SEM)	64.97 (1.98)	64.49 (0.76)	0.899
Sex, %			
Female	52.73	57.81	0.392
Male	47.27	42.19	
Race/ethnicity, %			
NH White	90.14	77.72	0.118
NH Black	3.22	8.59	
Hispanic	4.72	7.28	
NH other	1.91	6.40	
<i>Enabling factors</i>			
Marital status, %			
Never married	9.88	8.07	0.407
Married	61.54	56.65	
Widowed	17.03	16.38	
Divorced/separated	11.55	18.90	
Highest education completed, %			
Less than high school	20.08	11.26	0.127
High school	43.57	40.66	
College	17.68	19.97	
Graduate school/other	18.68	28.11	
Income, %			
Poor (<100% of FPL)	9.74	9.66	0.061
Low (100%–200% of FPL)	17.76	14.90	
Middle (200%–400% of FPL)	33.77	21.14	
High (≥400% of FPL)	38.73	54.30	
Insurance type, %			
Private	65.80	63.85	0.545
Public	29.51	34.09	
Uninsured	4.69	2.06	
Usual source of care, %			
No	10.32	8.02	0.558
Yes	89.68	91.98	
<i>Need factors</i>			
Time since treatment completed, %			
Currently in treatment	11.09	18.63	0.577
<1 y	9.45	5.37	
1–<3 y	10.19	9.64	
3–<5 y	8.00	10.26	
5–<10 y	16.00	14.59	
10–<20 y	19.91	22.69	
≥20 y	11.39	7.78	
Never treated	7.53	4.79	
Unknown	6.45	6.25	
Other comorbidities, %			
0–1	9.62	11.90	0.397
2–3	25.42	31.92	
≥4	64.97	56.17	

P values are from t-tests for tests of differences in age (a continuous variable) across rural/urban residence and from chi-square tests for differences in other variables across rural/urban residence.

FPL indicates the federal poverty level.

urban/rural residence. Approximately 42% of rural survivors reported discussing treatments received in detail, compared to 52% of urban survivors (P=0.046). Approximately 69% of rural and 70% of urban survivors reported that they had discussed follow-up care needs in detail with a healthcare professional. Lower percentages discussed in detail with a healthcare professional lifestyle and health recommendations (36% rural, 43% urban), emotional/social needs (24% rural, 33% urban), and long-term side effects (44% rural, 50% urban).

TABLE 2. Survivorship Care Discussions by Rural/Urban Residence

Discussion Variable	Response	Rural (%)	Urban (%)	<i>P</i>
Discussed follow-up care needs	In detail	68.87	70.31	0.8961
	Briefly	18.30	16.19	
	Did not/do not remember	12.83	13.50	
Discussed lifestyle and health recommendations	In detail	36.25	43.43	0.2828
	Briefly	38.08	28.34	
	Did not/do not remember	25.67	28.22	
Discussed emotional/social needs	In detail	24.38	33.36	0.2045
	Briefly	25.41	25.05	
	Did not/do not remember	50.22	41.59	
Discussed long-term side effects	In detail	43.54	49.88	0.502
	Briefly	27.35	22.13	
	Did not/do not remember	29.10	27.98	
Discussed treatments received	In detail	42.26	52.29	0.046
	Briefly	32.38	21.41	
	Did not/do not remember	25.36	26.29	

P values are from chi-square tests of differences in categorical discussion variables across rural/urban residences. Significant *P* values (<0.05) are bolded.

Ordered Logit Regression

Table 3 shows findings from ordered logit regressions of discussions about follow-up care, lifestyle and health recommendations, and emotional/social needs. Table 4 shows findings from ordered logit regression analyses of discussions about side effects and treatments received. Significant odds ratios and corresponding 95% confidence intervals are bolded in the tables and significant *P* values are included in the text below.

Adjusting for other factors, rural/urban residence was not significantly associated with any survivorship care variable. Among the other predisposing factors, gender, and race/ethnicity were associated with at least 1 dependent variable. Males had higher adjusted odds (OR 1.55; 95% CI, 1.03–2.33; *P*=0.036) of engaging in more detailed discussions about lifestyle/health recommendations than female survivors. Survivors who were non-Hispanic Black (OR 2.52; 95% CI, 1.22–5.20; *P*=0.013) and non-Hispanic other race/ethnicity (OR 2.33; 95% CI, 1.02–5.35; *P*=0.046) had higher adjusted odds of engaging in more detailed discussions about lifestyle/health recommendations than non-Hispanic White survivors. Non-Hispanic Black survivors also had higher adjusted odds of engaging in more detailed discussions about emotional/social needs (OR 3.24; 95% CI, 1.68–6.26; *P*<0.001) and side effects (OR 2.44; 95% CI, 1.31–4.54; *P*=0.005) than non-Hispanic White survivors.

Of the enabling factors, marital status, income, insurance coverage, and educational attainment were associated with at least one dependent variable. Married

survivors had higher adjusted odds (OR 1.96; 95% CI, 1.00–3.83; *P*=0.049) of engaging in more detailed discussions about emotional/social needs than non-married survivors. Low (OR 2.06; 95% CI, 1.07–3.98; *P*=0.031) and middle income (OR 1.76; 95% CI, 1.06–2.92; *P*=0.029) survivors had higher odds of engaging in more detailed discussions about lifestyle and health recommendations relative to high income survivors. Being uninsured was associated with greater odds of engaging in more detailed discussions about emotional/social needs (OR 4.56; 95% CI, 1.71–12.16; *P*=0.003) than having private insurance. Compared to those with a college education, those with less than a high school education had lower adjusted odds of engaging in more detailed discussion of side effects (OR 0.31; 95% CI, 0.13–0.71; *P*=0.006). Having a usual source of care was the only enabling factor not associated with any survivorship care variable.

Regarding need factors, years since cancer treatment were generally negatively associated with more detailed discussions about lifestyle/health recommendations, emotional/social needs, and discussions about a treatment summary (please refer to Tables 3 and 4 for the odds ratios for time since treatment). The number of comorbid conditions was not associated with any outcome.

Binary Logit Regression

Findings from supplemental binary logit regression analyses are reported in Supplemental Digital Content 1, Appendix Tables A, <http://links.lww.com/MLR/C843> and Supplemental Digital Content 2, Appendix Tables B, <http://links.lww.com/MLR/C844>. The findings from these analyses are generally similar to those from the ordered logit regression analyses. As was the case for the ordered logit regression analyses, no rural versus urban difference was found when adjusting for other factors. Among the other predisposing variables, non-Hispanic Black survivors had higher adjusted odds of discussing (OR 4.28; 95% CI, 2.04–8.97; *P*<0.001) emotional/social needs than non-Hispanic White survivors. Non-Hispanic Other survivors had higher adjusted odds of discussing (OR 3.83; 95% CI, 1.14–12.86; *P*=0.030) side effects than non-Hispanic White survivors.

Among the enabling factors, educational status was associated more frequently with the survivorship care variables in the binary logit regression analyses. Survivors with a high school education had lower adjusted odds of discussing the need for follow-up care (OR 0.31; 95% CI, 0.10–0.96; *P*=0.043) and side effects (OR 0.41; 95% CI, 0.18–0.94; *P*=0.034) relative to survivors with a college education. Survivors with less than a high school education had lower adjusted odds of discussing the need for follow-up care (OR 0.21; 95% CI, 0.05–0.90; *P*=0.035), side effects (OR 0.16; 95% CI, 0.06–0.46; *P*<0.001), and treatment summaries (OR 0.37; 95% CI, 0.14–0.99; *P*=0.047). Those with middle incomes had higher adjusted odds (OR 2.02; 95% CI, 1.06–3.86; *P*=0.034) of discussing side effects than those with high income, and those who were uninsured had higher odds (OR 10.93; 95% CI, 1.77–67.3; *P*=0.010) of discussing emotional/

TABLE 3. Ordered Logit Regression Analyses of Discussions about Follow-Up Care–Lifestyle/Health Recommendations, and Emotional/Social Needs

	Follow-Up Care	Lifestyle/Health	Emotional/Social
	OR (95% CI)	OR (95% CI)	OR (95% CI)
<i>Predisposing factors</i>			
Urban (vs. rural)	0.93 (0.55–1.58)	1.05 (0.60–1.82)	1.42 (0.90–2.22)
Age	1.01 (0.98–1.03)	0.99 (0.97–1.01)	0.98 (0.97–1.00)
Male (vs. female)	0.85 (0.55–1.31)	1.55 (1.03–2.33)	1.17 (0.81–1.69)
Race/ethnicity (vs. non-Hispanic White)			
Hispanic	2.07 (0.72–5.95)	0.81 (0.39–1.70)	0.98 (0.44–2.21)
Non-Hispanic Black	1.31 (0.61–2.80)	2.52 (1.22–5.20)	3.24 (1.68–6.26)
Non-Hispanic other	1.12 (0.36–3.52)	2.33 (1.02–5.35)	1.94 (0.85–4.44)
<i>Enabling factors</i>			
Marital status (vs. not married)			
Divorced/separated	1.11 (0.51–2.39)	1.33 (0.65–2.74)	1.20 (0.60–2.41)
Married	1.08 (0.51–2.31)	1.60 (0.87–2.93)	1.96 (1.00–3.83)
Widowed	0.60 (0.24–1.50)	0.50 (0.24–1.06)	0.88 (0.41–1.89)
Education (vs. college)			
Graduate school or other	1.19 (0.60–2.37)	1.51 (0.86–2.67)	1.51 (0.86–2.68)
High school	0.58 (0.31–1.08)	0.94 (0.59–1.51)	0.81 (0.47–1.41)
Less than high school	0.42 (0.16–1.10)	0.75 (0.37–1.51)	0.77 (0.35–1.67)
Income (vs. high)			
Poor	1.25 (0.56–2.79)	2.04 (0.94–4.43)	1.68 (0.84–3.38)
Low	0.96 (0.54–1.73)	2.06 (1.07–3.98)	1.63 (0.92–2.88)
Middle	1.59 (0.87–2.90)	1.76 (1.06–2.92)	1.41 (0.85–2.37)
Insurance (vs. private)			
Public	0.73 (0.45–1.19)	0.77 (0.48–1.25)	1.19 (0.75–1.89)
Uninsured	0.68 (0.19–2.41)	3.24 (0.96–10.94)	4.56 (1.71–12.16)
Usual source of care (vs. none)	1.43 (0.66–3.07)	1.59 (0.82–3.07)	1.08 (0.55–2.11)
<i>Need factors</i>			
Years since treatment (vs. in treatment)			
< 1 y	1.49 (0.51–4.33)	1.56 (0.68–3.57)	0.5 (0.23–1.08)
1–< 3 y	0.89 (0.35–2.22)	0.70 (0.33–1.46)	0.93 (0.46–1.91)
3–< 5 y	1.97 (0.67–5.76)	0.46 (0.23–0.96)	0.25 (0.11–0.56)
5–< 10 y	0.73 (0.32–1.67)	0.56 (0.32–0.97)	0.61 (0.34–1.09)
10–< 20 y	0.69 (0.32–1.50)	0.55 (0.29–1.04)	0.48 (0.26–0.87)
≥ 20 y	0.43 (0.18–1.08)	0.38 (0.16–0.87)	0.47 (0.20–1.07)
Never treated	0.46 (0.14–1.46)	0.24 (0.10–0.59)	0.19 (0.07–0.52)
Unknown	0.29 (0.11–0.73)	0.45 (0.19–1.06)	0.47 (0.21–1.04)
Other comorbidities (vs. 0–1)			
2–3	0.91 (0.44–1.87)	1.02 (0.58–1.81)	1.19 (0.63–2.23)
≥ 4	0.91 (0.42–1.98)	1.10 (0.62–1.95)	1.47 (0.78–2.78)

Dependent variable is coded as 1 = discussed in detail, 2 = discussed briefly, and 3 = did not discuss/do not remember. Significant ($P < 0.05$) findings are bolded. CI indicates confidence interval.

social needs than those with private insurance. Having a usual source of care was not a significant factor in any model. Lastly, time since treatment was generally associated with lower adjusted odds of discussing lifestyle/health needs, emotional/social needs, and side effects (please refer to Supplemental Digital Content 1, Appendix Tables A, <http://links.lww.com/MLR/C843> and Supplemental Digital Content 2, Appendix Tables B, <http://links.lww.com/MLR/C844> for the odds ratios corresponding to particular categories of time since treatment).

DISCUSSION

Cancer survivors need to receive follow-up care to detect new or recurrent cancers, monitor side effects resulting from treatment, and manage longer term physical and mental health outcomes following treatment.^{8,32} Discussions between survivors and health care professionals

are arguably a first step in assuring that survivors understand the importance of such services and seek them when needed. Rural residents have both higher cancer incidence and death rates² and many cancer patients have problems accessing treatment,³ raising concerns about whether they receive adequate cancer survivorship care. This study’s main objective was to investigate potential rural versus urban inequities in cancer survivors’ discussions with health care providers about their survivorship care needs.

We hypothesized that rural survivors would be less likely to discuss survivorship care, but this hypothesis was only partially confirmed, as the analyses revealed a single unadjusted rural versus urban difference in discussions of survivorship care (rates of discussing treatments received were lower among rural survivors). Prior research based on the 2011 MEPS similarly found no rural versus urban difference in discussions with health care providers about the need for follow-up care,¹⁸ but it did not examine other

TABLE 4. Ordered Logit Regression Analyses of Discussions About Side Effects and Treatment Summary

	Side Effects	Treatment Summary
	OR (95% CI)	OR (95% CI)
<i>Predisposing factors</i>		
Urban (vs. rural)	1.03 (0.67–1.59)	1.19 (0.76–1.87)
Age	0.99 (0.97–1.01)	0.99 (0.97–1.01)
Male (vs. female)	1.18 (0.84–1.67)	1.12 (0.79–1.59)
Race/ethnicity (vs. Non-Hispanic White)		
Hispanic	1.56 (0.69–3.52)	0.91 (0.44–1.86)
Non-Hispanic Black	2.44 (1.31–4.54)	1.88 (0.93–3.78)
Non-Hispanic other	1.52 (0.64–3.61)	0.53 (0.23–1.21)
<i>Enabling factors</i>		
Marital status (vs. never married)		
Divorced/separated	0.80 (0.39–1.64)	1.11 (0.49–2.50)
Married	1.08 (0.57–2.03)	1.25 (0.59–2.65)
Widowed	0.56 (0.23–1.35)	1.28 (0.58–2.84)
Education (vs. college)		
Graduate school or other	1.04 (0.60–1.81)	0.97 (0.56–1.70)
High school	0.64 (0.39–1.06)	0.84 (0.51–1.39)
Less than high school	0.31 (0.13–0.71)	0.75 (0.34–1.66)
Income (vs. high)		
Poor	1.21 (0.61–2.41)	0.91 (0.44–1.85)
Low	1.30 (0.77–2.20)	0.90 (0.51–1.58)
Middle	1.45 (0.88–2.38)	0.84 (0.49–1.45)
Insurance (vs. private)		
Public	1.03 (0.69–1.54)	0.75 (0.47–1.19)
Uninsured	1.27 (0.37–4.38)	1.10 (0.32–3.82)
Usual source of care (vs. none)	1.14 (0.56–2.36)	0.93 (0.50–1.75)
<i>Need factors</i>		
Years since treatment (vs. in treatment)		
< 1 y	0.77 (0.29–2.05)	0.91 (0.34–2.43)
1–< 3 y	0.42 (0.20–0.87)	0.47 (0.24–0.93)
3–< 5 y	0.33 (0.15–0.72)	0.70 (0.31–1.55)
5–< 10 y	0.33 (0.16–0.68)	0.65 (0.36–1.18)
10–< 20 y	0.39 (0.20–0.78)	0.98 (0.53–1.80)
≥ 20 y	0.25 (0.11–0.57)	0.43 (0.20–0.94)
Never treated	0.22 (0.08–0.59)	0.23 (0.10–0.49)
Unknown treatment	0.36 (0.16–0.85)	0.59 (0.25–1.40)
Other comorbidities (vs. 0–1)		
2–3	1.21 (0.65–2.24)	1.21 (0.58–2.51)
≥ 4	1.15 (0.61–2.19)	1.09 (0.60–1.96)

Dependent variable coded as 1 = discussed in detail, 2 = discussed briefly, and 3 = did not discuss/do not remember. Significant ($P < 0.05$) findings are bolded. CI indicates confidence interval.

dimensions of discussions about survivorship care. One explanation for failing to find additional rural versus urban differences is that other predisposing (e.g., race), enabling (e.g., income and education), and need (e.g., time since treatment) factors are simply more closely linked to discussions about survivorship care. We further address the practice and policy implications of other predisposing, enabling, and need factors later in the discussion section.

Although discussions about cancer survivorship differed little between rural and urban survivors, future research should investigate whether strategies for promoting survivorship care are equally effective in rural and urban settings. Rural residents' barriers to cancer treatment, including limited availabilities of local or nearby oncologists⁴ and extended travel times to cancer treatment

services,^{5,6} may require that they rely more on community-based primary care professionals for survivorship care than urban survivors. Other preliminary research suggests a need to educate rural primary care professionals about survivorship guidelines and coordinate survivorship services with cancer treatment specialists.⁷

Beyond testing for rural versus urban differences, a second objective was to determine how other predisposing, enabling, and need factors are associated with survivorship care discussions. Regarding predisposing factors, several positive findings were revealed for non-Hispanic Black survivors, who had higher odds of discussing in detail 3 aspects of survivorship care relative to non-Hispanic White survivors. Similarly, a paper based on the 2011 MEPS found that non-Hispanic Black survivors more frequently had higher-quality discussions about survivorship, as indicated by a summation of responses to the questions used as separate variables in this study.²⁹

Several enabling factors, including marital status, income, and education were associated with at least one survivorship discussion variable. Clinicians' practice experiences and attention to the social determinants of health may guide them to engage in more detailed discussions with divorced or separated, uninsured, or low- and middle-income survivors. The association between 1 enabling factor, having less than a high school education, and lower levels of discussions about side effects is concerning. Healthcare professionals may need to improve the clarity and frequency of communications about side effects from cancer and cancer treatment with patients of lower educational attainment. Having a usual source of care was not associated with discussions of any dimension of survivorship care, which was unexpected given the wealth of evidence demonstrating that having a usual clinician or place of care contributes to better health care coordination, continuity, and outcomes.³³ We originally planned to test whether having a primary care professional or other specialist as a usual source of care was associated with discussions about survivorship, but the MEPS questions related to a usual source of care are not specific to cancer care and the unweighted cell sizes were small. Future research should further explore how primary care professionals, oncology specialists and surgeons, and survivorship clinics coordinate and deliver follow-up.

One need factor, time since treatment, was generally associated with lower odds of having or remembering discussions about survivorship follow-up care, which is similar to findings reported in analyses of the 2011 MEPS.²⁹ Receiving instructions from a health care professional or clinic about the need for periodic follow-up care has been linked to higher odds of actual appointment attendance, secondary cancer surveillance, and current cancer prevention screenings.³⁴ Periodic discussions or reminders about the benefits of survivorship services could encourage the use of follow-up services over multiple years following cancer treatment.

Perhaps this study's most important overall finding is that rates of discussions about cancer survivorship care are suboptimal, despite considerable attention devoted

to developing and disseminating survivorship care guidelines.^{10–12} Other studies lend some insight into potential strategies for improving survivorship care. Prior research indicates that financial concerns are a barrier to the provision of survivor care plans among NCI-designated Comprehensive Cancer Centers,³⁵ and the ASCO has recommended that insurers pay for clinicians to engage in discussions about survivorship care.¹⁰ Others have recommended improved coordination among cancer treatment specialists and primary care providers,³⁶ which could plausibly help to increase rates of discussions about survivorship care needs.

Study Limitations

This study has several limitations pertaining to the measurement of discussions about survivorship care, the assessment of the clinicians who engaged in those discussions, and the identification of the determinants of those discussions. The survivorship care questions are subject to recall bias, especially among survivors who completed treatment many years prior to the survey, and the questions also lack specificity about whether oncologists, primary care professionals, or other clinicians discussed with them survivorship care. Moreover, the questions illicit whether discussions took place, but they do not assess the quality of survivorship care. Lastly, future research using path analyses or structural equation modeling could help to identify the underlying mediators of any rural versus urban differences and further inform health policy makers and practitioners about how to ameliorate inequities of care.³⁷

CONCLUSIONS

This study found limited evidence of rural versus urban differences in cancer survivors' discussions of posttreatment needs with healthcare professionals. Overall, rates of discussing in detail survivorship care needs in detail were low among both rural and urban survivors.

REFERENCES

- Davis JC, Cromartie J, Farrigan T, et al. *Rural America at a glance: 2023 edition* (Report No. EIB-261). U.S. Department of Agriculture, Economic Research Service.
- Blake KD, Moss JL, Gaysynsky A, et al. Making the case for investment in rural cancer control: An analysis of rural cancer incidence, mortality, and funding trends. *Cancer Epidemiol Biomarkers Prev*. 2017;26:992–997.
- Charlton M, Schlichting J, Chioreso C, et al. Challenges of rural cancer care in the United States. *Oncology (Williston Park)*. 2015;29:633–640.
- Kirkwood MK, Bruinooge SS, Goldstein MA, et al. Enhancing the American Society of Clinical Oncology workforce information system with geographic distribution of oncologists and comparison of data sources for the number of practicing oncologists. *J Oncol Pract*. 2014;10:32–38.
- Segel JE, Lengerich EJ. Rural-urban differences in the association between individual, facility, and clinical characteristics and travel time for cancer treatment. *BMC Public Health*. 2020;20:196.
- Ward MM, Ullrich F, Matthews K, et al. Access to chemotherapy services by availability of local and visiting oncologists. *J Oncol Pract*. 2014;10:26–31.
- Klemp J, Knight C, Lowry B, et al. Informing the delivery of cancer survivorship care in rural primary care practice. *J Cancer Surviv*. 2022;16:4–12.
- Institute of Medicine and National Research Council. *From Cancer Patient to Cancer Survivor: Lost in Transition*. Washington, DC: The National Academies Press; 2006.
- Jacobs LA, Shulman LN. Follow-up care of cancer survivors: challenges and solutions. *The Lancet Oncology*. 2017;18:e19–e29.
- McCabe MS, Bhatia S, Oeffinger KC, et al. American Society of Clinical Oncology statement: achieving high-quality cancer survivorship care. *J Clin Oncol*. 2013;31:631–640.
- Denlinger CS, Carlson RW, Are M, et al. Survivorship: introduction and definition. Clinical practice guidelines in oncology. *J Natl Compr Canc Netw*. 2014;12:34–45.
- Cowens-Alvarado R, Sharpe K, Pratt-Chapman M, et al. Advancing survivorship care through the National Cancer Survivorship Resource Center: developing American Cancer Society guidelines for primary care providers. *CA Cancer J Clin*. 2013;63:147–150.
- Jacobsen PB, DeRosa AP, Henderson TO, et al. Systematic review of the impact of cancer survivorship care plans on health outcomes and health care delivery. *J Clin Oncol*. 2018;36:2088–2100.
- Hong YR, Yadav S, Suk R, et al. Patient-provider discussion about emotional and social needs, mental health outcomes, and benefit finding among U.S. Adults living with cancer. *Cancer Med*. 2021;10:3622–3634.
- Weaver KE, Geiger AM, Lu L, et al. Rural-urban disparities in health status among US cancer survivors. *Cancer*. 2013;119:1050–1057.
- Burris JL, Andrykowski M. Disparities in mental health between rural and nonrural cancer survivors: a preliminary study. *Psychosomaticology*. 2010;19:637–645.
- Odahowski CL, Zahnd WE, Zgodic A, et al. Financial hardship among rural cancer survivors: an analysis of the Medical Expenditure Panel Survey. *Prev Med*. 2019;129S:105881.
- DiMartino LD, Birken SA, Mayer DK. The relationship between cancer survivors' socioeconomic status and reports of follow-up care discussions with providers. *J Cancer Educ*. 2017;32:749–755.
- National Cancer Institute, Division of Cancer Control and Population Sciences. Medical Expenditure Panel Survey (MEPS): Experiences with Cancer Survivorship Supplement. Available at: <https://healthcaresdelivery.cancer.gov/meps/> Accessed March 9, 2023.
- Yabroff KR, Dowling E, Rodriguez J, et al. The Medical Expenditure Panel Survey (MEPS) experiences with cancer survivorship supplement. *J Cancer Surviv*. 2012;6:407–419.
- Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995;36:1–10.
- Phillips KA, Morrison KR, Andersen R, et al. Understanding the context of healthcare utilization: assessing environmental and provider-related variables in the behavioral model of utilization. *Health Serv Res*. 1998;33(3 Pt 1):571–596.
- King CJ, Chen J, Dagher RK, et al. Decomposing differences in medical care access among cancer survivors by race and ethnicity. *Am J Med Qual*. 2015;30:459–469.
- Treanor C, Donnelly M. An international review of the patterns and determinants of health service utilisation by adult cancer survivors. *BMC Health Serv Res*. 2012;12:316; Published 2012 September 13.
- Borders TF. Rural community-dwelling elders' reports of access to care: Are there Hispanic versus non-Hispanic white disparities? *J Rural Health*. 2004;20:210–220.
- Borders TF, Booth BM, Stewart KE, et al. Rural/urban residence, access, and perceived need for treatment among African American cocaine users. *J Rural Health*. 2015;31:98–107.
- Borders TF, Rohrer JE. Rural residence and migration for specialty physician care. *Health Care Manage Review*. 2001;26:40–49.
- Borders TF, Rohrer JE, Hilsenrath PE, et al. Why rural residents migrate for family physician care. *J Rural Health*. 2000;16:337–348.
- Chawla N, Blanch-Hartigan D, Virgo KS, et al. Quality of patient-provider communication among cancer survivors: findings from a nationally representative sample. *J Oncol Pract*. 2016;12:e964–e973.
- Office of Management and Budget. 2010 Standards for delineating metropolitan and micropolitan statistical areas. *Federal Register*. 2010;75:37246–37252.
- SAS Institute Inc. *SAS/STAT®Users Guide: Introduction to Survey Sampling and Analysis Procedures*. Cary, NC: SAS Institute Inc; 2023.

32. Nekhlyudov L, Ganz PA, Arora NK, et al. Going beyond being lost in transition: a decade of progress in cancer survivorship. *J Clin Oncol*. 2017;35:1978–1981.
33. Starfield B, Shi L. The medical home, access to care, and insurance: a review of evidence. *Pediatrics*. 2004;113(5 Suppl):1493–1498.
34. Jabson JM. Follow-up care instructions, treatment summaries, and cancer survivors' receipt of follow-up health care and late/long term effects. *Support Care Cancer*. 2015;23:1851–1856.
35. Campbell MK, Tessaro I, Gellin M, et al. Adult cancer survivorship care: experiences from the LIVESTRONG centers of excellence network. *J Cancer Surviv*. 2011;5:271–282.
36. Salz T, Baxi S. Moving survivorship care plans forward: focus on care coordination. *Cancer Med*. 2016;5:1717–1722.
37. Borders TF. Advancing the field of rural health research: moving beyond simply documenting rural vs urban differences. *J Rural Health*. 2017;33:3–4.