



Church Attendance and Mobility Limitation Among Black and White Men With Prostate Cancer

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Abstract

Prostate cancer is a significant impediment that can reduce physical functional status. Mobility is fundamental for quality of life and church attendance to be associated with improved physical functioning. Few studies have examined how religious participation have implications for mobility limitation among men in general and among prostate cancer survivors in particular. The purpose of this study was to assess the association between church attendance and mobility limitation among Black and White prostate cancer patients and survivors. Data for this investigation were drawn from the Diagnosis and Decisions in Prostate Cancer Treatment Outcomes Study that consisted of 804 Black and White men with complete information on the primary outcome and predictor variables. Mobility limitation was the primary outcome variable, and church attendance was the main independent variable. The analytic sample was almost equally divided between Black ($N = 382$) and White men ($N = 422$). The proportion of Black men reporting mobility limitation (30.09%) more than doubled the corresponding percentage for White men (14.7%). Black men had a higher proportion of individuals who reported weekly church attendance (49.2% vs. 45.0%). Fully adjusted modified Poisson regression models produced results indicating that respondents attending church weekly had a lower mobility limitation prevalence (PR = 0.56, 95% CI [0.39, 0.81]) than those never attending church. Results from this study contribute to the body of evidence asserting the health benefits of church attendance. These findings suggest that health providers should consider how religion and spirituality can present opportunities for improved outcomes in prostate cancer patients and survivors.

Keywords

Mobility limitations, religiosity, health disparities, prostate cancer

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Prostate cancer is a cancer that is common among men during middle and late life and its incidence increases considerably with age (American Cancer Society, 2019). Data spanning 2012–2016 indicate that the incidence rate of prostate cancer for men aged 70–74 (652 per 100,000) was over 90 times greater than the corresponding rate for men between 40 and 44 years of age (7.8 per 100,000) (National Cancer Institute Surveillance Epidemiology and End Results Program, 2019). Race is a non-modifiable risk factor of note, as the burden of prostate cancer is not distributed equally across racial groups. Recent data indicate that the prostate cancer incidence rate for Black men is 60% higher than the

corresponding rate for White men (American Cancer Society, 2019). Black men are twice as likely to die from this disease as their white counterparts. Projections for 2020 indicate that 191,930 new cases of prostate cancer will be diagnosed, and Black men will represent a disproportionate share of them (American Cancer Society, 2020). Explanations for these gaps have included genetics, physiology, and health behavior; however, the underlying mechanisms associated with racial disparities in prostate cancer incidence and mortality remain elusive (American Cancer Society, 2019).

Advances in screening and treatment in recent years have improved chances for survival among Black and



White men; however, prostate cancer has been associated with health and functional status problems independent of the condition (Litwin, 1995; Potosky et al., 1999). Research has determined that prostate cancer diagnosis and treatment can adversely impact quality of life; however, only a few studies have examined how prostate cancer can have implications for age-related factors such as mobility. In a recent study, Thorpe et al. (2020) examined racial disparities in mobility status among prostate cancer survivors. Data from their analyses suggested that racial disparities in mobility limitation were largely due to socioeconomic differences. These findings indicated the need for research to elucidate social and behavioral factors that potentially could prolong mobility and protect against disablement in men experiencing prostate cancer diagnosis, treatment, and recovery.

Maintaining mobility is fundamental for independence, well-being, and quality of life for individuals, including prostate cancer survivors, during middle and late life (Hewitt et al., 2003; Simonsick et al., 2008; Thorpe, Clay, et al., 2011; Thorpe, Koster, et al., 2011). Mobility limitations such as difficulty walking for one-quarter mile or climbing one flight of stairs have been reported to precede mobility disability and related adverse outcomes among older adults (Guralnik et al., 1995; Simonsick et al., 2008; Thorpe, Clay, et al., 2011; Thorpe, Koster, et al., 2011; Verbrugge and Jette, 1994; Wolinsky et al., 2005; Wolinsky et al., 2007). In general, Black men tend to have worse mobility limitation than their White peers (Thorpe, Clay, et al., 2011; Thorpe, Koster, et al., 2011).

Church attendance is a factor that has been linked to better health and physical functioning. Studies have shown that church attendance has been associated with lower hypertension prevalence and blood pressure (Gillum and Ingram, 2006) and mortality (Bruce et al., 2017; Gillum et al., 2008; Koenig et al., 1999). Researchers analyzing data from the Established Populations for Epidemiologic Studies of the Elderly published articles indicating that church attendance was associated with better physical functioning (Hybels

et al., 2012; Idler & Kasl, 1997). Churches are typically places where males are valued and receive emotional, psychological, and behavioral resources that can be leveraged during stressful situations, including disease management and recovery (Bruce & Thorpe, 2019). Participation in organized religious services have been linked to hope, resilience, stress mitigation, and enhanced longevity (Bruce et al., 2017, 2020; Bruce & Thorpe, 2019; Chen et al., 2020; Gillum et al., 2008; Kim & VanderWeele, 2019; Koenig et al., 2012; Krause, 1997; Li et al., 2016). Numerous studies have examined the impact of church attendance on a variety of health outcomes; yet remarkably few have considered how this form of religious participation has implications for mobility limitation among men in general, and among prostate cancer survivors in particular. The purpose of the study was to assess the association and between church attendance and mobility limitation among Black and White men with prostate cancer.

Methods

Data

Data for this investigation were drawn from a cross-sectional examination of factors associated with treatment modality selection, disease burden, and quality of life among Black and White men with prostate cancer. The Diagnosis and Decisions in Prostate Cancer Treatment Outcomes study was conducted between October 2009 and December 2011, and included participants who classified themselves as Black or White, were at least 35 years of age, and received a diagnosis and treatment for prostate cancer. Potential participants were identified from reports generated by a research network of hospitals affiliated with the North Carolina Central Cancer Registry and a rapid case ascertainment procedure described elsewhere (Bowie et al., 2017; Kinlock, Parker, Bowie, et al., 2017; Kinlock, Parker, Howard, et al., 2017) was used to confirm eligibility. Eligible prospective participants were

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mailed an information packet containing a recruitment letter describing the study, a North Carolina Central Cancer Registry brochure, and a copy of the consent forms. The recruitment letter and consent forms provided the study office phone number and encouraged prospective participants to call to ask questions or decline participation. Research staff called each prospective participant to confirm eligibility, provide further details about the study, address questions, and inquire about willingness to participate. Eligible men who were willing to participate completed and signed consent forms that were reviewed by research staff. An additional step was taken to confirm informed consent, as participants were also asked to confirm their signature and give research staff verbal approval to begin survey administration. Study participants completed an in-person survey consisting of items asking about experiences with prostate cancer and its treatment, church attendance before and after treatment, and mobility status. This analysis included 804 men in the sample who had complete information on church attendance and limited mobility. This study was approved by the Johns Hopkins Bloomberg School of Public Health, the US Department of Defense, and North Carolina Central Cancer Registry Institutional Review Boards.

Study Variables

The primary outcome for this study was mobility limitation. This dichotomous variable was derived from participant responses to items asking whether their health or physical problems precluded them from walking a quarter mile (approximately two–three blocks) or up one flight of stairs (approximately 10 steps). Men in the sample who reported difficulty walking a quarter mile or up one flight of stairs were considered to have limited mobility (coded 1). Men who did not report any difficulty were coded “0.”

Church attendance was the primary independent variable and was derived from an interview question asking respondents “Since your diagnosis, how many times in an average month have you attended your place of worship (not counting weddings and funerals)?” Responses were transformed into three categories: “no church attendance,” “three or fewer times per month,” “one or more times per week” (Bruce et al., 2017; Gillum et al., 2008).

A number of clinical variables were included in this analysis. Treatment modality was measured with a series of indicator variables specifying the prostate cancer treatment received by a respondent. Prostatectomy, radiation beam, radiation seeds, hormone therapy, watchful waiting, or other form of treatment were the variables included. The Gleason score measure was a categorical variable derived from values on pathology reports. The categories were low-grade (Gleason score ≤ 6), medium-grade

(Gleason score 7), and high-grade (Gleason score 8–10) cancer. The time between diagnosis and treatment variable was derived from items asking respondents to report the date of diagnosis and the date of treatment initiation and subtract the self-reported number of months elapsed between the two dates. Their responses were then classified into three categories: “less than 3 months,” “between 3 and 8 months,” and “more than 8 months.” Respondents reporting watchful waiting as their treatment had missing data for this variable because this modality did not involve intervention, making the time between diagnosis and initial treatment difficult to report and assess.

This analysis also included a number of demographic variables. Age was a continuous variable reflecting the response to an item asking participants to report their age in years. Race was a dichotomous variable derived from a question asking participants to report whether they considered themselves to be Black (coded 1) or White (coded 0). Marital status was represented by a dichotomous variable indicating whether respondents reported being married (coded 1) or not (coded 0). Income was a categorical variable derived from responses to the item asking participants to report total household income “from all sources before taxes, included wages, salaries, and any other income.” Responses were then classified to three categories: “less than \$50K,” “\$50K–\$100K,” and “more than \$100K.” Educational attainment was derived from responses to an item asking respondents to select the category representing the highest education level completed. The categories for this study included “less than high school graduate,” “high school graduate,” “some college or associate degree,” “baccalaureate degree,” and “graduate degree.” Health insurance was represented by a dichotomous variable indicating whether respondents reporting having health insurance (coded 1) or not (coded 0).

Data Analysis

Percentages and mean and standard deviations were calculated to characterize the total sample. Chi-square and Student’s *t* tests were performed to assess the proportional and mean differences by race for the variables in the study, respectively. Because the prevalence of mobility limitation in the sample was greater than 10%, we conducted a Modified Poisson regression with robust standard errors to estimate prevalence ratios (PR) and corresponding 95% confidence intervals. We estimated the relationship between church attendance and mobility limitation for the total sample, adjusting for clinical and demographic covariates. For all analyses, *p* values less than or equal to .05 were considered statistically significant and tests were two-sided. All statistical analyses were completed using STATA statistical software, Version 16.

Table 1. Characteristics of African American and White Men in the Diagnosis and Decisions in Prostate Cancer Treatment Outcomes Study for the Total Sample and by Sex.

	Total (<i>n</i> = 804)	White Men (<i>n</i> = 422)	AA Men (<i>n</i> = 382)	<i>p</i> Value
African American (%)	47.5			
Age mean (<i>SD</i>)	63.1(7.7)	63.8 (7.8)	62.3 (7.6)	.006
Married (%)	75.9	85.3	65.5	<.001
Annual income (%)				<.001
Less than \$50K	37.1	18.7	57.3	
\$50–\$100K	40.2	44.8	35.1	
More than \$100K	22.8	36.5	7.8	
Education (%)				<.001
Did not complete high school	11.6	5.0	18.9	
High school graduate	24.0	13.6	34.3	
Some college/Associate degree	22.4	23.4	21.2	
Baccalaureate degree	23.2	30.1	15.7	
Graduate degree	18.9	27.0	10.0	
Has health insurance (%)	93.2	96.7	89.5	<.001
Gleason score (%)				
Low-grade cancer	51.4	54.9	47.5	.096
Medium-grade cancer	40.4	38.0	43.0	
High-grade cancer	8.2	7.1	9.5	
Treatment received (%)				.005
Prostatectomy	68.6	73.3	63.3	
Radiation beam	12.6	9.6	16.0	
Radiation seeds	4.3	3.7	5.0	
Hormone therapy	1.3	0.7	2.0	
Other treatment	4.3	2.9	5.9	
Watchful waiting	8.9	9.8	7.8	
Time to treat (%)				.002
Less than 3 months	49.8	50.7	48.7	
Between 3 and 8 months	43.5	45.7	40.8	
Over 8 months	6.8	3.7	10.4	
Church attendance after prostate cancer (%)				.010
No church attendance	24.1	28.4	19.4	
Three or fewer times per month	28.9	26.5	31.4	
One or more times per week	47.0	45.0	49.2	
Mobility limitation (%)	22.4	14.7	30.9	<.001

Note. The proportions presented are the rounded, so they may not add up to 100.
SD = standard deviation.

Results

A description of the study sample by race is displayed in Table 1. The analytic sample was almost equally divided between Black ($N = 382$) and White men ($N = 422$), and racial disparities were observed for all but one variable in the study. Black men in the study were 18 months younger than White participants (62.3 ± 7.6 vs. 63.8 ± 7.8), and the proportion of Black respondents who were married (65.5%, $n = 250$) was considerably lower than White sample members (85.3%, $n = 340$). Additionally, descriptive statistics show that Black sample members were socioeconomically distinct from their White peers in the

study. The segment of Black sample members with at least a baccalaureate degree (25.7%, $n = 98$) was less than half than the percentage of White participants with at least an undergraduate degree (57.1%, $n = 241$). Further, the proportion of Black respondents reporting incomes over \$100K (7.8%, $n = 30$) was one-fourth the corresponding percentage for White sample members (36.5%, $n = 154$). The segment of Black sample members with health insurance (89.5%, $n = 342$) was smaller than the corresponding portion of White respondents with health insurance (96.7%, $n = 408$). Table 1 reports racial differences in the types of treatment and time to treatment.

The proportion of Black men in the study having more than 8 months lapse before treatment (10.4%, $n = 40$) was nearly three times the corresponding percentage of their White peers (3.7%, $n = 16$). There was a significant difference in mobility limitation as the proportion of Black men reporting mobility limitation (30.09%, $n = 115$) more than doubled the corresponding percentage for White men (14.7%, $n = 62$). The results in Table 1 show that Black men in the sample attended church more regularly than their White peers. Black men had higher percentages of individuals who reported attending church than their White peers. Larger segments of Black sample members reported attending church at least weekly (49.2% [$n = 188$] vs. 45.0% [$n = 190$]) and three or fewer times per month (31.4% [$n = 120$] vs. 26.5% [$n = 112$]) than White participants.

Prevalence ratios for association between church attendance and mobility limitation among Black and White men with prostate cancer are displayed in Table 2. Results in the unadjusted model indicate that weekly church attendance is inversely associated with mobility limitation as Model 1 indicates that men in the sample attending church at least once per week after prostate cancer diagnosis had a lower prevalence of mobility limitation (PR = 0.70 [95% CI [0.51, 0.97]]) than sample members who never attended church. This correlation held in the fully adjusted model. After adjusting for demographic, socioeconomic, and clinical factors, men who attended church weekly after diagnosis continued to have a lower prevalence of mobility limitation (PR = 0.56 [95% CI [0.39, 0.81]]) than their peers who never attended church. None of the demographic variables were statistically significant. Education, income, and treatment received were other variables correlated with mobility limitation.

Discussion

Prostate cancer is a slow-growing cancer that is common among middle-age and older men in the United States (American Cancer Society, 2020). Advances in biomedical science have resulted in multiple treatments that can prolong longevity after diagnosis. The 10-year survival rate for all races and stages combined is 98% (American Cancer Society, 2020); however, cancer therapies (surgery, radiotherapy, hormone therapy, chemotherapy) can be disruptive by limiting mobility and accelerating the disablement process. Church attendance is a factor that has been linked to functional health (Hybels et al., 2012; Idler & Kasl, 1997; Kelley-Moore & Ferraro, 2001), and our study examined the degree to which this form of religious participation is associated with mobility limitation among Black and White men with prostate cancer. Prostate cancer survivors who attended church on a weekly basis were significantly less likely to have trouble

walking one-fourth mile or climbing a flight of stairs. This result suggests that frequent church attendance can have positive implications for men during and after prostate cancer treatment; however, additional studies are needed to determine if and specify how religious practices contribute to the preservation of mobility among men with chronic conditions.

Our findings are consistent with a small body of research demonstrating the protective effects of frequent church attendance on mobility limitations (Hybels et al., 2012; Idler & Kasl, 1997); however, this study is significant because it presents data from a racially diverse sample of prostate cancer survivors. Earlier studies examining church attendance and other forms of religious participation and functional status present data from samples in which health histories were largely unknown. Chronic conditions with implications for physical functioning were generally not assessed and participants tended to be relatively healthy at data collection (Hybels et al., 2012). Our study is unique because every participant had prostate cancer, a potentially physically debilitating condition with treatments that could also have adverse implications for mobility.

The present study is significant because our findings clearly demonstrate that the benefits of church attendance extend to men. Gender is often overlooked in the faith and health literature. Men typically have lower levels of religious participation than women (Pew Research Center, 2019); however, religious institutions continue to be largely male oriented. Churches, mosques, and temples have been institutions primarily under male leadership that provided safe places for males to receive life skills, leadership skills, and support for the expression of hegemonic masculinity (Bruce & Thorpe, 2019; Ellis et al., 2015). The relative impact of supportive religious environments for mobility among prostate cancer survivors and men in general remains unclear. But the observed association between church attendance and less mobility decline among men with serious health issues can stimulate hypothesis generation for future studies specifying mechanisms linking religious participation to functional health among men across the life course.

Race was a significant consideration in the present study given the multiple disparities between Black and White men documented in the social and health science literature. Our descriptive results show Black and White men in our study to be different across nearly all the variables considered in our analysis. A larger segment of Black men reported mobility limitations and attending church on a weekly basis; however, the statistical significance of the race variable was attenuated when socioeconomic indicators were added to the regression models. Race and socioeconomic status are often inextricably linked at the individual and community levels (Bruce

Table 2. Association Between Mobility Limitation and Church Attendance Among African American and White Men With Prostate Cancer.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Church Attendance						
No attendance	1.00	1.00	1.00	1.00	1.00	1.00
≤ 3 times per month	0.97 [0.70, 1.34]	0.89 [0.65, 1.22]	0.85 [0.60, 1.21]	0.90 [0.63, 1.29]	0.81 [0.58, 1.16]	0.88 [0.62, 1.25]
1 + times per week	0.70 [0.51, 0.97]	0.63 [0.47, 0.86]	0.56 [0.39, 0.80]	0.58 [0.40, 0.83]	0.53 [0.37, 0.75]	0.56 [0.39, 0.81]
African American						
		2.03 [1.55, 2.69]	1.70 [1.25, 2.29]	1.26 [0.92, 1.75]	1.28 [0.93, 1.78]	1.17 [0.84, 1.63]
Age						
		1.04 [1.02, 1.06]	1.02 [1.00, 1.04]	1.01 [1.00, 1.04]	1.01 [0.99, 1.03]	1.01 [0.99, 1.03]
Married						
		0.61 [0.47-0.79]	0.74 [0.55, 1.00]	0.85 [0.63, 1.14]	0.88 [0.66, 1.19]	0.89 [0.67, 1.19]
Has insurance						
		0.84 [0.53, 1.33]	0.75 [0.48, 1.19]	0.81 [0.52, 1.25]	0.87 [0.55, 1.37]	0.84 [0.54, 1.29]
Income						
Less than 50K					1.00	1.00
50K–100K					0.55 [0.38, 0.80]	0.77 [0.52, 1.14]
Over 100K					0.39 [0.21, 0.72]	0.69 [0.35, 1.38]
Education						
Less than HS				1.00		1.00
High school				0.60 [0.43, 0.85]		0.63 [0.45, 0.88]
Some college				0.52 [0.35, 0.79]		0.57 [0.38, 0.87]
Bachelor's degree				0.29 [0.17, 0.50]		0.34 [0.19, 0.60]
Graduate degree				0.22 [0.11, 0.44]		0.26 [0.13, 0.53]
Gleason Score						
Low-grade cancer			1.00	1.00	1.00	1.00
Med-grade cancer			1.35 [0.99, 1.85]	1.31 [0.96, 1.77]	1.35 [1.00, 1.83]	1.30 [0.96, 1.77]
High-grade cancer			1.49 [0.91, 2.45]	1.38 [0.83, 2.28]	1.42 [0.88, 2.27]	1.37 [0.84, 2.24]
Treatment received						
Prostatectomy			1.00	1.00	1.00	1.00
Radiation beam			1.82 [1.25, 2.65]	1.70 [1.19, 2.44]	1.66 [1.15, 2.41]	1.65 [1.15, 2.37]
Radiation seeds			2.85 [1.76, 4.61]	2.60 [1.62, 4.18]	2.60 [1.58, 4.26]	2.57 [1.60, 4.15]
Hormone therapy			1.68 [0.65, 4.38]	1.53 [0.58, 4.05]	1.60 [0.63, 4.12]	1.50 [0.57, 3.94]
Other treatment			2.18 [1.36, 3.49]	1.90 [1.20, 3.01]	1.90 [1.22, 2.96]	1.84 [1.17, 2.88]
Watchful waiting			0.37 [0.05, 2.50]	0.44 [0.07, 2.85]	0.38 [0.06, 2.61]	0.44 [0.07, 2.86]
Time to treat						
Less than 3 months			1.00	1.00	1.00	1.00
Between 3 and 8 months			0.79 [0.58, 1.09]	0.95 [0.70, 1.29]	0.85 [0.62, 1.16]	0.96 [0.70, 1.30]
Over 8 months			1.37 [0.88, 2.13]	1.45 [0.96, 2.20]	1.43 [0.93, 2.20]	1.47 [0.97, 2.23]

Note. Table entries are unstandardized coefficients.

et al., 1998; Thorpe et al., 2015, 2020). LaVeist et al. (2008) assert that racial disparities research is often complicated by the overlap between race and socioeconomic status. Our findings are consistent with Thorpe et al. (2020), and we likewise suggest that the racial gap in mobility limitation is a function of the stark socioeconomic status differences between Black and White men in the sample. Race has implications for a number of social measures, and additional studies are needed to determine how racial disparities in income and education rooted in structural and systematic inequality influence differences in mobility limitation among Black and White prostate cancer survivors.

Our study had some noteworthy limitations. Church attendance is a common, yet limited, proxy for religious participation. The type and form of religious services can vary considerably across religions and within religious denominations or sects (Bruce et al., 2020). Data presented in this study were generated from cross-sectional statistical models; therefore, one cannot infer causality or temporal order. As such, one could not determine the direction of relation between church attendance and mobility limitation. The analytic sample was drawn from a sample of prostate cancer survivors living in a single state in the mid-Atlantic region of the United States. Results from this study may not be generalizable to the larger population of prostate cancer patients and survivors. Lastly, data for the study were primarily self-report, and limitations such as recall bias and social desirability apply to this study.

Conclusions

The results from our study suggest that church attendance may play a protective role from mobility decline and disablement for men experiencing serious health conditions such as prostate cancer. Additional research and learning from other studies will help us better understand the protective mechanisms that religion and faith institutions may confer to buffer illness and promote well-being. It will be important for health-care providers to consider how religion, spirituality, and faith can be leveraged to improve outcomes among men with challenging health conditions, treatments, and recoveries.

Declaration of Conflicting Interests

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