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The association between the number of chronic health conditions and advance care planning varies by race/ethnicity

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Abstract

Objectives: Although a national consensus exists on the need to increase the rates of advance care planning (ACP) for all adults, racial/ethnic differences in ACP have been consistently observed. This study investigated the intersection of racial/ethnic differences and the number of chronic health conditions on ACP among middle-aged and older adults in the United States.

Method: Responses from 8,926 adults from the 2014 wave of the Health and Retirement Study were entered into multilevel hierarchical logistic regression analyses with generalized linear mixed models to predict ACP focused on assigning a durable power of attorney for healthcare (DPOAHC) and having a written living will after adjusting for covariates.

Results: We found a significant positive relationship between the number of chronic health conditions and ACP. Non-Hispanic Black/African Americans and Hispanics were less likely to engage in ACP than non-Hispanic White/Caucasians. Racial/ethnic disparities were even starker for completing a living will. The number of chronic health conditions had a greater effect for Hispanics than non-Hispanic White/Caucasians on ACP through assigning a DPOAHC and having a living will. The initial disparity in ACP among Hispanics with no chronic health conditions decreased as the number of chronic health conditions increased.

Conclusion: Our findings suggest that more chronic health conditions increase the likelihood that Hispanics will complete ACP documents. These ACP differences should be highlighted to

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Disclosure statement

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researchers, policymakers, and healthcare professionals to reduce stark racial/ethnic disparities in ACP. A comprehensive and culturally caring decision-making approach should be considered when individuals and families engage in ACP.

Keywords

Advance care planning; durable power of attorney for healthcare; living will; race/ethnicity; chronic health conditions

Introduction

Health inequalities are to a substantial degree due to race/ethnicity related differences in healthcare decisions (Oliver, 2009), such as advance care planning (ACP) (Herman, 2013; Smith et al., 2008). ACP is defined as "...a process that supports adults at any age or stage of health in understanding and sharing their personal values, life goals, and preferences regarding future medical care." (Sudore et al., 2017, p. 821). Since the mid-1970's, ACP has been promoted as the primary legal means to communicate formally one's healthcare wishes (Sabatino, 2010). In 1990, the federal government passed the Patient Self-Determination Act (PSDA) that promotes one's right for making healthcare decisions by ensuring that individuals' wishes are established, documented, and followed (Detering, Hancock, Reade, & Silvester, 2010; McAfee, Jordan, Sheu, Dake, & Miller, 2017). The PSDA requires any healthcare facility receiving federal funding to inform patients about advance directives—a durable power of attorney for healthcare (DPOAHC) and a living will.

A DPOAHC, also called a medical power of attorney or healthcare proxy, is assigned through a legal document that appoints an agent to make healthcare decisions on behalf of a principal who is unable to make those decisions for oneself. In addition, providing written instructions—often called a living will—is important to make one's wishes clear because it clarifies the care or medical treatment that a person wants to receive if that person becomes incapacitated and cannot make those decisions. ACP also diminishes the likelihood of stress, anxiety, and depression in surviving relatives (Detering et al., 2010). Many healthcare providers suggest that all adults at any age or stage of health should have a living will and a DPOAHC (Sudore et al., 2017). However, the estimates of the prevalence of completing an advance directive, DPOAHC and living will, range from 18% to 36% of adults in the United States (Detering et al., 2010; Lynn, Curtis, & Lagerwey, 2016; Pollack, Morhaim, & Williams, 2010).

Chronic health condition and ACP

People having more than one chronic health condition may have more reasons to engage in ACP and may have more opportunities to communicate with healthcare professionals (Carr, 2012; Hash, Bodnar-Deren, Leventhal, & Leventhal, 2016). Indeed, Hash and colleagues (2016) suggest that the perceived burden of one's health conditions creates a motivation to seek out and obtain a DPOAHC. Also, Carr (2012) demonstrates that persons in fair or poor health are more likely to have a living will than persons in good or better health. Regarding willingness to complete ACP, Ko and colleagues (2016) found that individuals with poorer health status are 43% more willing to complete ACP among low-income older adults who

did not complete ACP ($n = 204$) (Ko, Lee, & Hong, 2016). Having more chronic health conditions may affect ACP in later life, but whether the impact of having these conditions on ACP differentially impact racial/ethnic minorities is unclear.

Racial/ethnic disparities in ACP

According to the U.S. population projections of the U.S. Census Bureau (Colby & Ortman, 2014), the Hispanic population is projected to increase from 55 million (17.4%) in 2014 to 119 million (28.6%) in 2060. By contrast, the non-Hispanic White population is predicted to fall from 198 million (62.2%) in 2014 to 182 million (43.6%) in 2060. Based on these changing demographics of the U.S., a considerable number of studies have explored the extent of racial/ethnic differences in ACP (Carr, 2011; Carr, 2012; Lynn et al., 2016; McAfee et al., 2017; Melhado & Bushy, 2011; Smith et al., 2008). Researchers have demonstrated that racial/ethnic minorities often complete fewer ACP documents (Lynn et al., 2016; Smith et al., 2008; Suri, Egleston, Brody, & Rudberg, 1999).

Previous literature shows racial/ethnic disparities in ACP among clinical populations such as patients with cancer (e.g., Mack et al., 2010; Smith et al., 2008) or nursing home residents (e.g., Suri et al., 1999). Smith and colleagues (2008) studied 312 non-Hispanic White/Caucasian, 83 non-Hispanic Black/African American, and 73 Hispanic patients with advanced cancer and found that compared with non-Hispanic White/Caucasian patients (80%), non-Hispanic Black/African American patients (47%) and Hispanic patients (47%) were less likely to have an ACP. Among nursing home residents, Suri and colleagues (1999) compared White-Black differences in ACP and found that Black residents were much less likely to have an ACP than White residents. Studies have also attempted to explain racial/ethnic disparities in ACP using behavioral theory. For example, McAfee and colleagues (2017) used the Integrated Behavioral Model and the Precaution Adoption Process Model and found significant racial/ethnic differences in ACP: 33% of non-Hispanic White/Caucasians had completed ACP versus Hispanics (18%) and non-Hispanic Black/African Americans (8%). Although McAfee et al. (2017) analyzed randomly selected American adults of all races aged 40 to 80, the sample size was small (i.e., 249 non-Hispanic White/Caucasians, 64 non-Hispanic Black/African Americans, 61 Hispanics). Thus, the present study used a large-scale nationally representative data set that might provide a more comprehensive picture of Americans' ACP in middle-aged and older adults. White-Black differences in ACP completion rates were also discussed (e.g., Koss & Baker, 2017; Gerst & Burr, 2008), but comparatively little attention has been paid to Hispanic ethnicity differences in ACP. Thus, one of goals of the present study is to investigate whether disparities in ACP also occur for Hispanics and Whites. Understanding these racial/ethnic differences in ACP is important because engagement in ACP has increased over the last decade (Silveira, Wiitala, & Piette, 2014), but racial/ethnic minorities may not have benefited from the rising rates of ACP completion to the same extent that non-Hispanic White/Caucasians (Carr, 2011; Carr, 2012; Lynn et al., 2016; Mack et al., 2010; McAfee et al., 2017; Melhado & Bushy, 2011; Smith et al., 2008; Suri et al., 1999).

Socioeconomic inequities are of the leading reasons for poor completion of ACP documents that might explain the racial/ethnic disparities in ACP. Socioeconomic inequities are

important because they affect access to both health information and care (Herman, 2013; Levi, Dellasega, Whitehead, & Green, 2010). Specific contributing factors include health literacy (Melhado & Bushy, 2011; Volandes et al., 2008), religious beliefs (Johnson, Kuchibhatla, & Tulskey, 2008; Lynn et al., 2016; Smith et al., 2008), experience with the painful deaths of loved ones (Carr, 2011), and death attitudes (Lynn et al., 2016). Race/ethnicity also is inter-related with a number of demographic and socioeconomic factors associated with ACP including homeownership and being of higher socioeconomic status are positively associated with the completion of ACP documents (Alano et al., 2010; Carr, 2011; Su, 2008; Suri et al., 1999; Woolsey, Danes, & Stum, 2017). However, even these factors do not entirely rule out the role of racial/ethnic differences in ACP (Smith et al., 2008; Volandes et al., 2008). Thus, understanding how race/ethnicity impact ACP needs further investigation. Despite the growing literature documenting ACP differences in racial/ethnic groups, little attention has been paid to those factors that might impact the likelihood of racial/ethnic groups completing ACP documents. As of now, little theoretical work has been formalized to account for racial/ethnic disparities in ACP and possible factors (e.g., number of chronic health conditions) that might lead to or even reduce these disparities.

Race/ethnicity and chronic health condition

Prior literature has documented that racial/ethnic minorities are more likely to have many major chronic diseases compared with non-Hispanic Whites/Caucasians (Bodenheimer, Chen, & Bennett, 2009; Levi et al., 2010). For example, racial/ethnic disparities in the prevalence of multiple chronic health conditions have been found to include cancer, diabetes, and cardiovascular disease between non-Hispanic Blacks/African Americans and non-Hispanic Whites/Caucasians in the United States (Assari, 2017; Daw, 2017; Rooks, Kapral, & Mathis, 2017). Specifically, Daw (2017) reported that racial/ethnic minority groups experience several combinations of diseases at rates 50%–89% higher than non-Hispanic Whites/Caucasians. In particular, Hispanics are more likely to have two chronic conditions (i.e., obesity and chronic kidney disease) at rates 89% higher and three chronic conditions (i.e., obesity, diabetes mellitus, and chronic kidney disease) at rates 50% higher than non-Hispanic Whites/Caucasians. Similarly, non-Hispanic Blacks/African Americans are more likely to have two chronic conditions (i.e., obesity and hypertension) at rates 54% higher and three chronic conditions (i.e., diabetes mellitus, hypertension, and chronic kidney disease) at rates 77% higher than non-Hispanic Whites/Caucasians. While the specific conditions and rates vary across people, the overall number of chronic health conditions is often times greater, on average, in racial/ethnic minorities.

In addition to these numerous chronic health conditions, comorbidity and mortality rates have been found to be the highest among Black older adults than any other racial/ethnic groups with the leading causes of death for Black older adults being heart disease, cancer, stroke, diabetes, and pneumonia (Daw, 2017; Satcher & Pamies, 2006; Volandes et al., 2008). Daw (2017) demonstrated that racial/ethnic disparities in comorbidity remained true when individual health behaviors and neighborhood fixed effects were statistically adjusted for.

The intersection of chronic health condition, race/ethnicity, and ACP

These different patterns of chronic health conditions across racial/ethnic groups might be related to disparities in the completion of ACP documents. As noted above, prior literature shows that chronic health conditions are tied to engaging in ACP (Carr, 2012; Hash et al., 2016) and chronic health conditions vary by race/ethnicity (Assari, 2017; Bodenheimer, Chen, & Bennett, 2009; Daw, 2017; Levi et al., 2010; Rooks, Kapral, & Mathis, 2017; Satcher & Pamies, 2006; Volandes et al., 2008). However, little is known about the relationship of the number of chronic health conditions and ACP across racial/ethnic groups. Race/ethnicity might moderate the effects of health on ACP because of varying health issues, socioeconomic factors, demographic factors, or cultural factors. While some research suggests that more numerous chronic health conditions have been associated with more ACP, these findings might only apply to the primary populations previously studied (i.e., non-Hispanic Whites/Caucasians). If this were to be the case, then marginalized individuals with chronic health conditions likely to have less interaction with medical providers would have lower prevalence of ACP engagement than non-Hispanic Whites/Caucasians. The absence of ACP may increase the difficulty both families and practitioners may experience in making a decision on treatment choices in favor of patient wishes (Waddell, Clarnette, Smith, & Oldham, 1997).

Yet, results from prior studies have been mixed and much remains unknown about the intersection between chronic health conditions, race/ethnicity, and ACP. For example, previous literature has indicated that Blacks with chronic conditions are less likely to have ACP documents and more likely to prefer life-sustaining interventions than other racial/ethnic groups (Melhado & Bushy, 2011; Volandes et al., 2008). In contrast, Mack and colleagues (2010) found that Blacks and Whites have similar rates of end-of-life discussion among patients with advanced cancer (Black patients 35.3% versus White patients 38.4%).

Some research has suggested that Hispanics have lower mortality from cancer and cardiovascular disease than non-Hispanics (e.g., Sorlie, Backlund, Johnson, & Rogot, 1993) and overall lower mortality than what might be expected due to average levels of socioeconomic status, especially among older adults—referred to as the Latino or Hispanic Paradox (Markides & Coreil, 1986). Instead, Hispanics have a particular mortality risk from diabetes (e.g., Sorlie et al., 1993). These very different patterns of minority health between Hispanics and non-Hispanics (including Blacks) might lead to different patterns of ACP completion. To the extent that contact with health providers is important for understanding the benefits of ACP, the lower mortality risk and/or fewer chronic health conditions in Hispanics might be one reason for lower ACP in Hispanics. Given the complexity and unknown relationship between these three variables in prior research, the strength of the relationship between chronic health and ACP across diverse racial/ethnic groups is not clear.

The present study

To our knowledge, no research has examined the interplay between the number of chronic health conditions and race/ethnicity and how they might predict ACP documents completion using a large scale nationally representative data set. The present study takes a first step at understanding the factors underlying how underrepresented populations might engage in

ACP among middle-aged and older American adults using a large scale nationally representative data set. Specifically, we examined racial/ethnic disparities in ACP, to analyze the association between the number of chronic health conditions and ACP, and further to examine whether race/ethnicity moderates the association among middle-aged and older adults. We predicted that among racial/ethnic minority groups in the sample, we might find different relationships between the number of chronic health conditions and ACP relative to non-Hispanic Whites/Caucasians. While as a group, non-Hispanic Blacks/African Americans and Hispanics often experience similar societal barriers and economic burden that might contribute to a lower rate of ACP, each group has different profiles of chronic health conditions and potentially different strategies of preparing for future health. Based on the theoretical considerations and empirical research discussed above and consistent with previous literature, our three hypotheses for this study are as follows:

Hypothesis 1: non-Hispanic Blacks/African Americans and Hispanics will be less likely to assign a DPOAHC and have a written living will than non-Hispanic Whites/Caucasians.

Hypothesis 2: The number of chronic health conditions will be positively related to assigning a DPOAHC and having a written living will.

Hypothesis 3: Race/ethnicity will moderate the association between the number of chronic health conditions and ACP among middle-aged and older adults.

To test our three hypotheses, the present study used a nationally representative data set in the United States.

Methods

Data and sample

Data were drawn from the 2014 wave of the Health and Retirement Study (HRS), which is a nationally representative longitudinal panel study of adults 51 years or older and their spouses of any age in the United States. The HRS is sponsored by the National Institute of Aging and the Social Security Administration, and is conducted by the Institute for Social Research at the University of Michigan. The HRS survey, which has been fielded every 2 years since 1992, was established to provide a national resource for data on the changing health and economic circumstances associated with aging at both individual and population levels (Sonnega, Faul, Ofstedal, Langa, Phillips, & Weir, 2014). Thus making it a valuable resource for investigating ACP in middle-aged and older adults. The data collection period for the 2014 wave of the HRS was March 2014 through April 2015.

Inclusion and exclusion criteria.—We used a total of 9,139 respondents who completed the survey for ACP variables (i.e., DPOAHC and written living will) and corresponding covariates. Racial and ethnic groups analyzed were non-Hispanic White ($n = 6,736$), non-Hispanic Black ($n = 1,304$), and Hispanic of any race ($n = 886$). We excluded non-Hispanic ‘other’ race ($n = 213$, which included American Indian, Alaskan Native, Asian, Native Hawaiian, and Pacific Islander) in these analyses due to the small number of

cases. Thus, our final analyses included 8,926 middle-aged and older adults based on all our inclusion/exclusion criteria.

Measures

Dependent variables.—We used two dependent variables of ACP: assignment of a DPOAHC and having a living will. Each dependent variable was dichotomously-coded (1 for yes; 0 for no). The ACP included: (1) ‘Have you made any legal arrangements for a specific person or persons to make decisions about your care or medical treatment if you cannot make those decisions yourself? This is sometimes called a durable power of attorney for healthcare.’ and (2) ‘Have you provided written instructions about the care or medical treatment that you want to receive if you cannot make those decisions yourself? This is sometimes called a living will.’

Independent variable.—Number of chronic health conditions was measured by asking, ‘If respondents ever had a history of high blood pressure, diabetes, cancer, lung disease, heart problems, stroke, psychiatric problems, or arthritis (1 for yes; 0 for no).’ A sum score was then calculated, ranging from 0 to 8. Higher scores suggest more chronic health conditions (Assari, 2017).

Moderator.—Race and Hispanic ethnic status consisted of a set of two dichotomous variables: non-Hispanic Black, and Hispanic (any race). Non-Hispanic White was used as the reference category for each of the moderators.

Covariates.—Socioeconomic and demographic characteristics were included in the analyses as covariates. Selection of the socioeconomic and demographic control variables was based on a number of well-established findings from previous literature on the factors associated with ACP. These characteristics included age, sex, total household income, total household wealth, educational attainment, marital status, the presence of living children, and employment status. Total household income is the sum of all income from the respondent and spouse in each household. Household income included before-tax income from: (1) earnings, unemployment, and workers’ compensation, (2) Social Security, Supplemental Security Income (SSI), public assistance, and veterans’ benefits, (3) pension and retirement income, (4) interest, dividends, rents, royalties, and income from estates and trusts, (5) educational assistance, (6) alimony and child support, (7) assistance from outside the household, and (8) other sources. Income excluded: (1) noncash benefits (e.g., food stamps) and (2) capital gains and losses. Total household wealth was calculated as the sum of all wealth components less all debt. That is, sum of (1) value of the respondent’s primary residence, (2) net value of real estate, (3) net value of vehicles, (4) net value of businesses, (5) net value of IRA/Keogh, (6) net value of stocks and mutual funds, (7) value of checking, savings, and money market accounts, (8) value of CDs, government savings bonds, and treasury bills, (9) net value of bonds or bond funds, and (10) net value of all other savings less sum of (1) value of all mortgages, (2) value of all other home loans other than the first or second mortgages plus the balance on an equity line of credit, and (3) value of debt. The presence of living children was measured by asking, ‘Do you have any living children?’ The variable was dichotomously-coded (1 for yes; 0 for no).

Analysis

Descriptive statistics were analyzed for all variables, including two binary outcomes and covariates. Chi-square and one-way analysis of variance (ANOVA) tests were conducted to examine differences across racial/ethnic groups for ACP, number of chronic health conditions, and key socioeconomic and demographic characteristics. Multicollinearity was not considered problematic for the empirical model. To examine our hypotheses, we used hierarchical logistic regression models by having the binary ACP measures as outcome variables. Specifically, race/ethnicity (non-Hispanic Blacks/African Americans and Hispanics of any race) was included as a predictor after adjusting for socioeconomic and demographic characteristics (i.e., age, years of education, total household income, total household wealth, sex, marital status, the presence of living children, and employment status) at Step 1. We centered the continuous variables, such as age, years of education, log of total household income, and log of total household wealth, at the mean to make the estimated intercept value more representative. Next, the number of chronic health conditions (i.e., sum of chronic health conditions ever had high blood pressure, diabetes, cancer, lung disease, heart problems, stroke, psychiatric problems, or arthritis: range = 0–8) was added to the baseline model at Step 2. At Step 3, we examined the moderating effect of race/ethnicity on the association between the number of chronic health conditions and ACP.

Further, we used the multilevel logistic regression with generalized linear mixed models to account for the nested data structure (i.e., 8,926 household members were nested within 6,776 households). In the HRS dataset, while the majority of households included one respondent (68.8%), some households included two or more respondents (31.2%), which was a partially nested data structure. Family members generally share and discuss their ACP needs and family is the primary context in which ACP decisions are made and implemented (Woolsey et al., 2017). Since research has acknowledged ‘family’ as a context in ACP in both the spousal context (Moorman, 2011) and the parent-child context (Woolsey et al., 2017), using a multilevel structure was most appropriate (Moerbeek & Wong, 2008). We computed the intra-class correlation coefficients (ICC) for assigning a DPOAHC and having a written living will to test whether there were sufficiently large data dependency within same households, and indeed, we found a sufficiently large ICC to validate our assumptions (Snijders & Bosker, 1999). Multilevel models for binary outcomes were analyzed with GENLIN MIXED procedure in IBM SPSS 23 (IBM Corp., Armonk, NY).

Results

Descriptive statistics

Table 1 presents descriptive statistics for the sample characteristics. All study variables and covariates were significantly different across racial/ethnic groups, with the exception of nursing home residency. The mean age for the sample was 75.81 years old ($SD = 7.31$) and the average years of education was 12.58 years ($SD = 3.19$). The mean and median total household income for the sample were \$59,574 and \$37,364, respectively. The mean and median total household wealth for the sample were \$510,349 and \$191,000, respectively. The sample included more females (58.7%) and married individuals (58.7%). The respondents currently lived in the following regions: South (43%), Midwest (24.4%), West

(18%), and Northeast (14.7%). In terms of employment status, 78.1% were retired, whereas 6.6% reported that they were currently working full time. There were 1.2% of respondents living in a nursing home and there was no significant difference across racial/ethnic groups.

Regarding chronic health conditions, non-Hispanic Blacks/African Americans had the highest mean number of chronic health conditions ($M = 2.90$, $SD = 1.44$) with a total range of 0 to 8 and Hispanics had the lowest ($M = 2.66$, $SD = 1.44$) with a total range of 0 to 7. The average number of chronic health condition for non-Hispanic Whites was 2.69 ($SD = 1.46$) with a total range of 0 to 8. The prevalence of each health condition differed significantly across racial/ethnic groups. Namely, more non-Hispanic Whites/Caucasians relative to other racial/ethnic groups reported they ever had cancer (23.6%), lung disease (13.5%), and heart disease (36.1%). Meanwhile, more non-Hispanic Blacks/African Americans reported they ever had high blood pressure (84.9%), stroke (14.4%), and arthritis (75%). Lastly, more Hispanics reported they ever had diabetes (42.2%) and psychiatric problems (24%).

The ACP variables also were significantly different across racial/ethnic groups. We found statistically significant relationships between race/ethnicity and: (1) assigning a DPOAHC ($\chi^2(2) = 476.885$, $p < .001$) and (2) having a living will ($\chi^2(2) = 795.710$, $p < .001$). Overall, non-Hispanic Whites/Caucasians made better preparation for ACP as compared to non-Hispanic Blacks/African Americans and Hispanics. That is, while 61.2% of non-Hispanic Whites/Caucasians indicated that they assigned a DPOAHC, 39.4% of non-Hispanic Blacks and 28.9% of Hispanics reported that they did. Similar to DPOAHC, 61.2% of non-Hispanic Whites/Caucasians had a written living will, whereas 30.5% of non-Hispanic Blacks and 21.6% of Hispanics reported having a written living will.

Results from multilevel logistic regression analyses

Table 2 presents the results of the multilevel hierarchical logistic regression analyses with the two ACP measures as outcome variables. First, the *unconditional model* with no predictors and covariates was analyzed to assess the ICC, which represents the correlation among the members in the same household. Two ACP variables had ICC values (.18 and .20 for DPOAHC and living will, respectively) that were above the conventional criteria ($>.10$; Snijders & Bosker, 1994), which required a multilevel data structure. Next, to examine our hypotheses, a series of logistic regression models (*conditional models*) was analyzed by testing the main effect of race/ethnicity after taking into account the socioeconomic and demographic variables at Step 1, adding the main effect of the number of chronic health conditions into the baseline model at Step 2, and examining the interaction effects between race/ethnicity and the number of chronic health conditions at Step 3.

At the first step (Model 1), after controlling for all covariates, the results provided support for our first hypothesis regarding the racial/ethnic disparities in ACP. We found that non-Hispanic Blacks/African Americans and Hispanics had fewer ACP documents completed than non-Hispanic Whites/Caucasians. Specifically, non-Hispanic Blacks ($OR = 0.558$, $p < .001$, 95% confidence interval (CI) = 0.482, 0.645) and Hispanics ($OR = 0.490$, $p < .001$, 95% CI = 0.406, 0.593) were less likely to assign a DPOAHC than non-Hispanic Whites/Caucasians. Similarly, non-Hispanic Blacks/African Americans ($OR = 0.402$, $p < .001$, 95%

CI = 0.345, 0.468) and Hispanics ($OR = 0.360$, $p < .001$, 95% CI = 0.294, 0.442) were less likely to have a written living will than non-Hispanic Whites/Caucasians.

In addition, our results showed that individuals that were older, had higher educational attainment, were wealthier (i.e., higher total household income and total household wealth), and were female were more likely to have the two ACP documents completed. In contrast, married adults were less likely to assign a DPOAHC ($OR = 0.690$, $p < .001$, 95% CI = 0.612, 0.778) and have a written living will ($OR = 0.784$, $p < .001$, 95% CI = 0.693, 0.888). However, the presence of living children showed no statistically significant relationship with having the two ACP documents. Interestingly, full-time workers relative to retirees were less likely to have assigned DPOAHC ($OR = 0.502$, $p < .001$, 95% CI = 0.407, 0.619) and written living will ($OR = 0.523$, $p < .001$, 95% CI = 0.422, 0.648).

At the second step, the results of our study also provided support for our second hypothesis. We found that the number of chronic health conditions were positively related to assigning a DPOAHC ($OR = 1.089$, $p < .001$, 95% CI = 1.051, 1.127) and having a written living will ($OR = 1.093$, $p < .001$, 95% CI = 1.055, 1.133). The association between race/ethnicity and ACP still remained significant.

Interaction effects of race/ethnicity on the relationship between comorbidity and ACP

At the third step, interaction variables between the main predictors of race/ethnicity and the number of chronic health conditions were entered into the model. The results provided partial support for our hypothesized interaction effects. Overall, a greater number of chronic health conditions had a greater impact on ACP for non-Hispanic Blacks/African Americans and Hispanics than for non-Hispanic Whites/Caucasians (see Figures 1 and 2). Significant interactions occurred between the effect of chronic health conditions and the Hispanic group on assigning a DPOAHC ($OR = 1.148$, $p = .027$, 95% CI = 1.016, 1.297). That is, the number of chronic health conditions had a greater effect for Hispanics than non-Hispanic Whites/Caucasians on assigning a DPOAHC. As shown in Figure 1, the initial disparity in Hispanics with no chronic health conditions decreased (became more similar to non-Hispanic Whites) as the number of chronic health conditions increased. While non-Hispanic Blacks showed the same general pattern as Hispanics, the pattern did not reach significance ($OR = 1.053$, $p = .293$, 95% CI = 0.957, 1.159).

Similarly, as shown in Table 2 and Figure 2, the number of chronic health conditions had greater effects for Hispanics than non-Hispanic Whites/Caucasians on having a living will. Marginally significant interactions were found for the Hispanic group for having a written will ($OR = 1.120$, $p = .091$, 95% CI = 0.982, 1.278). Figure 2 shows that although both non-Hispanic Blacks/African Americans and Hispanics revealed a disparity in ACP when they had no chronic health conditions ($OR = 0.400$, $p < .001$, 95% CI = 0.343, 0.467 and $OR = 0.370$, $p < .001$, 95% CI = 0.302, 0.454, respectively), the gap decreased for Hispanics as the number of chronic health conditions increased.

Discussion

A national consensus exists on the need to increase the rates of ACP for all adults and initiatives to improve ACP are increasing in the clinical, research, and public sector (Detering et al., 2010; Sabatino, 2010; Sudore et al., 2017). ACP is an important means for promoting dignity and autonomy at the end of life. Although there is a gradually increasing trend in overall rates of ACP nationally (Sabatino, 2010; Sudore et al., 2017), racial/ethnic differences in ACP have been consistently observed and knowledge, religious and cultural beliefs, and attitudes have been found as contributing factors to these disparities (Bullock, 2011; Herman, 2013; Shrank et al., 2005; Smith et al., 2008; Johnson et al., 2008; Lynn et al., 2016). Given the limited understanding of the role that the intersection of chronic health conditions and race/ethnicity have in ACP later life (Assari, 2017; Daw, 2017; Rooks et al., 2017), we explored racial/ethnic differences in ACP, as well as the moderating role of race/ethnicity in the association between the number of chronic health conditions and ACP among middle-aged and older adults in the United States. Drawn from a large population-based study, we found evidence that the number of chronic health conditions was positively associated with ACP and that racial/ethnic minorities were less likely to complete ACP documents. Furthermore, we found that race/ethnicity moderated the association between the number of chronic health conditions and ACP.

Given the dramatically increasing numbers of racial/ethnic minority adults in the United States and the potentially detrimental effect of inadequate ACP in later life, findings from the present study are particularly relevant. Consistent with past studies, this study confirmed that a significantly smaller percentage of non-Hispanic Blacks/African Americans and Hispanics completed ACP documents than their non-Hispanic Whites counterparts (Carr, 2011; Johnson et al., 2008). These racial/ethnic disparities in ACP should be understood from both structural (e.g., access to healthcare and health information; Herman, 2013; Levi et al., 2010; Rooks et al., 2017) and cultural contexts (e.g., religious beliefs, perception, and attitudes; Bullock, 2011; Herman, 2013; Shrank et al., 2005; Smith et al., 2008; Johnson et al., 2008; Lynn et al., 2016). Some of these contexts may inadvertently pose barriers to complete ACP documents in racial/ethnic minorities.

Cultural and religious beliefs play a role in the decision making of non-Hispanic Black patients regarding ACP (Bullock, 2011; Herman, 2013; Shrank et al., 2005; Smith et al., 2008; Johnson et al., 2008; Lynn et al., 2016). The interplay of multiple cultural factors appears to have a pronounced effect on attitudes toward ACP among racial/ethnic minorities (Noah, 2012). Particularly, lack of comfort discussing death and religious beliefs reduce the willingness of non-Hispanic Blacks/African Americans to complete ACP (Johnson et al., 2008). In addition to broader influences of cultural and religious beliefs, much of explanation for these racial/ethnic differences in ACP appears to lie in distrust in the medical system and in physicians (Johnson et al., 2008; Noah, 2012), complexities of communication (Noah, 2012), lack of knowledge of ACP options (Bullock, 2006), limited access to healthcare (Herman, 2013; Levi et al., 2010; Rooks et al., 2017), or poorer health status overall (Noah, 2012).

Given that chronic health conditions differ across racial/ethnic groups, it is important to better understand the culturally bound behaviors and attitudes that may contribute to disparities in ACP (Bullock, 2011; Herman, 2013; Shrank et al., 2005). Previous studies document that racial/ethnic minorities are more likely to have negative attitudes toward discussing ACP (e.g., Murphy et al., 1996; Waters, 2001). An understanding of the intersection between chronic health conditions and race/ethnicity may provide a culturally-specific explanation for disparities in ACP and assist communities in reducing racial/ethnic disparities and practitioners in achieving cultural competence (Bullock, 2011; Shrank et al., 2005; Smith et al., 2008).

It is plausible that Hispanics perceive ACP as an unnecessary, irrelevant, and overly formal approach to decisions that have traditionally rested with family members (Carr, 2011; Morrison, Zayas, Mulvihill, Baskin, & Meier, 1998). As Blackhall and colleagues (1995) have suggested, Hispanics are more likely to hold a family-centered model of medical decision making, whereas non-Hispanic Blacks/African Americans and non-Hispanic Whites/Caucasians are more likely to hold the patient autonomy model (Blackhall et al., 1995). Similarly, Morrison and colleagues (1998) found that compared with non-Hispanic Whites/Caucasians (12%) and non-Hispanic Blacks/African Americans (19%), Hispanics (67%) more believed that DPOAHC was not necessary when one had involved family and also were significantly less likely to have assigned a DPOAHC.

Despite these large racial/ethnic disparities in ACP, the disparities did not occur at all levels of health. In fact, one of the notable findings here was the significant moderating role of race/ethnicity in the relationship between the number of chronic health conditions and ACP. We found that non-Hispanic Blacks/African Americans and Hispanics were less likely to assign a DPOAHC for those who had no chronic health conditions compared to non-Hispanic Whites/Caucasians, but these disparities were eliminated for both groups of minorities who had more chronic health conditions. This finding suggests that health problems may motivate racial/ethnic minorities to engage in ACP. These results are in line with previous studies that found declining health motivated people to obtain additional ACP (e.g., Hash, Bodnar-Deren, Leventhal, & Leventhal, 2016), possibly due to the additional contact with healthcare professionals. In addition, prior research has documented that racial/ethnic minorities are less likely to have medical insurance (e.g., Andrulis, 1998; Betancourt, Green, Carrillo, & Ananeh-Firempong, 2003), are more likely to distrust healthcare professionals (e.g., Eleazer et al., 1996; Hallenbeck, Goldstein, & Mebane, 1996; Johnson et al., 2008), and often receive poorer healthcare (e.g., Gornick et al., 1996; Harris, Andrews, & Elixhauser 1997; Todd, Samaroo, & Hoffman, 1993). Sociocultural differences in trust in the medical system and knowledge about ACP may partially account for racial/ethnic disparities in ACP (Gerst & Burr, 2008). For example, Morrison and colleagues (1998) found that Hispanics (44%) significantly less trusted physicians and the healthcare system compared with Blacks (82%) and Whites (84%) and also Hispanics were less likely to engage in ACP among aged 65 years or older individuals attending a geriatrics and internal medicine outpatient clinic of a large New York City teaching hospital. Each of these factors might contribute to a hesitance in completing ACP documents. For example, racial/ethnic minorities may not trust that they will receive culturally sensitive advice or recommendations. For Hispanics, specifically, language barriers also might exist that would

facilitate communication between them and individuals that could help them complete ACP documents. These barriers might then only be broken down when healthcare contact dramatically increases.

It should be highlighted that while having more chronic health conditions motivated racial/ethnic minorities to engage in ACP, the outcomes depended on the type of ACP. Health conditions impacted the likelihood of assigning a DPOAHC for Hispanics and to a lesser extent non-Hispanic Blacks/African Americans. This finding is in line with a recent study reporting that disparities in ACP between Whites and Blacks have begun to narrow even though significant racial/ethnic disparities still remain (Koss & Maker, 2017). Although it is not entirely clear in the current literature what cultural differences may lead to these differential outcomes, some possibilities include differences in family structure that impact the type of conversations and topics families have (Bullock, 2011; Emanuel, Danis, Pearlman, & Singer, 1995; Herman, 2013; Shrank et al., 2005; Winzelberg, Hanson, & Tulskey, 2005). Healthcare professionals working with Hispanic older adults may need to encourage them and their families to have more discussions, guide ACP in the family context, visualize possible disease trajectories (van der Steen et al., 2014) before they become seriously ill, and highlight their families as part of the system-wide intervention.

An understanding of ACP has important implications for policy at both the state and federal levels (Sabatino, 2010). In addition to the PSDA of 1991, which requires any healthcare facility receiving federal funding to inform patients about advance directives, the Centers for Medicare and Medicaid Services (CMS) pays healthcare providers for voluntary ACP discussions with Medicare beneficiaries, beginning January 1, 2016. All these recent policy changes and efforts may potentially help reduce racial/ethnic disparities in ACP for people who are in contact with healthcare providers. Nevertheless, these policies are not always effectively carried out and policymakers should continue to increase public awareness for ACP to increase the rates of ACP for all adults (Carr, 2012) and to reduce disparities in access to ACP across all racial/ethnic groups. One potential barrier is that information service related to ACP may not be readily accessible to individuals with fewer resources. Our findings demonstrate that individuals with the lowest level of total household income were some of the least likely to complete ACP documents and that racial/ethnic minorities had about half the level of income as non-Hispanic Whites/Caucasians, suggesting compounding factors lead to such low rates of ACP. Even disparities in healthcare expenditures among older adults are well documented (Betancourt et al., 2003; National Research Council, 2004). Previous findings indicate that non-Hispanic Blacks/African Americans and Hispanics relative to non-Hispanic Whites/Caucasians have significantly higher end-of-life healthcare expenditures (Carr, 2012; Nicholas, Langa, Iwashyna, & Weir, 2011). Thus, ACP may have a greater effect on end-of-life healthcare of vulnerable populations, such as racial/ethnic minorities and low socioeconomic status groups (Williams, 1990), than on the aging population in general (National Research Council, 2004).

Laws and policies related to ACP have been moving toward an ongoing and flexible process ('communication-oriented approach') from standardized legal forms with procedural requirements and limitations ('legal transactional approach') (Sabatino, 2010). Thus, the

roles of the healthcare professionals and social work professionals in working with individuals and families on ACP are also becoming more important to minimize risks and maximize benefits in later life. Most importantly, ACP should be understood within the context of relationships with close loved ones rather than only the physician-patient (Singer et al., 1998) or the attorney-client relationships. Based on the nature of one's racial/ethnic backgrounds, decision-making approach for ACP among family members, friends, and relatives should be applied in a more culturally sensitive manner. Culturally and linguistically competent assessments are critical to understand how individuals and families approaches ACP (Bullock, 2011; Herman, 2013).

The associations between socioeconomic and demographic characteristics and engaging in ACP also warrant some brief comments. Consistent with previous studies (Alano et al., 2010; Carr, 2011, 2012; Lynn et al., 2016; Su, 2008; Suri et al., 1999; Woolsey, Danes, & Stum, 2017), individuals who are older, female, wealthier, and have higher educational attainment were more likely to engage in ACP. In contrast, married adults and full-time workers are less likely to engage in ACP. While previous work documents that the presence of living children impacts engaging in ACP (e.g., Hopp, 2000), this study finds no significant associations between the presence of living children and the completion of ACP documents, suggesting equal-sized effects for both groups (e.g., the presence of living children versus no living child).

The present study is not without limitations. First, given the cross-sectional nature of the study, the present study could not explain whether chronic health conditions are causal factors leading to an increase in ACP. Future longitudinal analyses are needed to determine whether the increasing number of chronic health conditions tracks ACP completion. Second, other racial/ethnic groups such as Asians and American Indians/Alaska Natives were available in the HRS, but they were not included in these analyses due to the small number of cases. In 2015, U.S. Census Bureau projected that the Asian population is the second fastest-growing group in U.S., so other racial/ethnic groups including Asians should be highlighted in future research. In addition, analyzing sub-groups within the racial/ethnic groups could not be considered. Third, the HRS does not have measures about culturally bound behaviors and attitudes that can help understand the effects of culture on ACP. Further investigations are suggested to better understand the role of cultural concept within the family context in ACP completion (Morrison et al., 1998). Lastly, particular combinations of chronic conditions might also be an important predictor of ACP that also varies by race/ethnicity.

Despite these limitations, we provided clear evidence of racial/ethnic differences in ACP and a significant positive relationship between the number of chronic health conditions and ACP, and a significant moderating role of race/ethnicity in the association between the number of chronic health conditions and ACP. The present study adds to a growing literature on ACP by showing unique racial/ethnic patterns of the complex relation between chronic health conditions and ACP using a large scale nationally representative data set. Findings provide implications for future research, policy, and practice in terms of who to target to reduce the racial/ethnic gap in ACP and minimize the effect of chronic conditions on ACP in later life. To facilitate and promote ACP effectively, practitioners including healthcare service

providers and social workers might consider each individual's cultural beliefs, values, communications patterns, and biopsychosocial context and tailor interventions accordingly (Bullock, 2011; Herman, 2013; Smith et al., 2008).

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Figure 1.
Interaction of the number of chronic conditions and race/ethnicity to predict DPOAHC

Figure 2.
Interaction of the number of chronic conditions and race/ethnicity to predict living will

Table 1.

Sample descriptive statistics: Chi-square and one-way ANOVA results ($N = 8,926$).

Variable	Total ($N = 8,926$)	M $\pm$ SD (Mdn) or %			χ^2 (df) or F (df_b , df_w)
		non-Hispanic White ($n = 6,736$)	non-Hispanic Black ($n = 1,304$)	Hispanic ($n = 886$)	
Age (years)	75.81 $\pm$ 7.31	76.23 $\pm$ 7.34	74.57 $\pm$ 7.08	74.43 $\pm$ 7.05	45.840 (2, 8923) ***
Years of education	12.58 $\pm$ 3.19	13.22 $\pm$ 2.57	11.83 $\pm$ 3.03	8.87 $\pm$ 4.60	930.171 (2, 8923) ***
Total household income (\$)	59,574.14 $\pm$ 98,438.79 (37,364.00)	67,235.20 $\pm$ 106,756.27 (42,878.12)	36,588.44 $\pm$ 40,512.18 (22,914.00)	35,159.28 $\pm$ 82,173.06 (19,194.00)	84.761 (2, 8923) ***
Total household wealth (\$)	510,349.26 $\pm$ 1,165,806.39 (191,000)	620,364.15 $\pm$ 1,287,486.98 (275,656)	147,572.52 $\pm$ 361,721.77 (51,500)	207,866.88 $\pm$ 721,911.17 (51,400)	126.407 (2, 8923) ***
Female	58.7	57.7	64.1	57.7	18,708 (2) ***
Married	54.3	57.8	36.8	54.0	193,955 (2) ***
Number of living children	3.33 $\pm$ 2.14	3.14 $\pm$ 1.97	3.78 $\pm$ 2.51	4.10 $\pm$ 2.53	114.807 (2, 8742) ***
Census region					671,152 (6) ***
Northeast	14.7	15.1	15.3	10.6	
Midwest	24.4	28.0	19.7	3.4	
South	43.0	39.7	58.8	44.8	
West	18.0	17.3	6.1	41.1	
Employment status					68,811 (6) ***
Works full-time	6.6	6.5	6.7	7.1	
Works part-time or partly retired	11.3	11.9	10.1	8.5	
Retired	78.1	78.0	80.1	75.5	
Unemployed or disabled	4.0	3.5	3.1	8.8	
Live in nursing home	1.2	1.2	1.3	1.0	0.378 (2)
Number of chronic health conditions ^a	2.72 $\pm$ 1.46	2.69 $\pm$ 1.46	2.90 $\pm$ 1.44	2.66 $\pm$ 1.44	11,586 (2, 8923) ***
Ever had high blood pressure	71.4	68.1	84.9	76.3	162,158 (2) ***
Ever had diabetes	28.3	24.1	40.4	42.2	235,430 (2) ***
Ever had cancer	22.0	23.6	18.9	14.4	46,919 (2) ***
Ever had lung disease	12.7	13.5	11.4	7.8	25,197 (2) ***

Variable	M ± SD (Mdn) or %			Hispanic (n = 886)	$\chi^2(df)$ or $F(df_b, df_w)$
	Total (N = 8,926)	non-Hispanic White (n = 6,736)	non-Hispanic Black (n = 1,304)		
Ever had heart disease	34.2	36.1	29.9	26.1	47.352 (2) ***
Ever had stroke	12.4	12.3	14.4	10.2	8.695 (2) ***
Ever had psychiatric problems	18.8	18.8	15.3	24.0	25.964 (2) ***
Ever had arthritis	72.5	72.8	75.0	66.4	20.860 (2) ***
Assigned a DPOAHC	54.8	61.2	39.4	28.9	476.885 (2) ***
Had a written living will	52.8	61.2	30.5	21.6	795.710 (2) ***

^aSum of chronic health conditions ever had high blood pressure, diabetes, cancer, lung disease, heart problems, stroke, psychiatric problems, or arthritis.

p < .001.

Table 2.

Multilevel hierarchical logistic regressions for likelihood of advance care planning (ACP) ($N = 8,926$).

Models/Variables	Durable power of attorney for healthcare (DPOAHC)			Living will		
	M1	M2	M3	M1	M2	M3
<i>Main effects</i>						
Race/ethnicity						
non-Hispanic White (ref.)						
non-Hispanic Black	0.558***	0.557***	0.482***	0.402***	0.400***	0.349***
Hispanic (any race)	0.490***	0.504***	0.346***	0.360***	0.370***	0.272***
Number of chronic health conditions ^a		1.089***	1.068**		1.093***	1.077***
<i>Covariates</i>						
Age	1.067***	1.066***	1.066***	1.064***	1.063***	1.063***
Educational attainment (years)	1.095***	1.099***	1.100***	1.118***	1.123***	1.123***
Log of total household income	1.276***	1.289***	1.287***	1.324***	1.339***	1.338***
Log of total household wealth	1.074***	1.080***	1.081***	1.101***	1.107***	1.108***
Female	1.216***	1.232***	1.226***	1.346***	1.366***	1.361***
Married	0.690***	0.691***	0.689***	0.784***	0.786***	0.784***
Presence of living children	1.127	1.114	1.116	1.001	0.987	0.988
Employment status						
Retired (ref.)						
Works full-time	0.502***	0.534***	0.532***	0.523***	0.557***	0.556***
Works part-time or partly retired	0.775**	0.803**	0.803**	0.736***	0.765**	0.764**
Unemployed or disabled	0.826	0.834	0.829	0.853	0.862	0.859
<i>Interaction effects</i>						
non-Hispanic White $\times$ Number of chronic health conditions (ref.)						
non-Hispanic Black $\times$ Number of chronic health conditions			1.053			1.050
Hispanic $\times$ Number of chronic health conditions			1.148*			1.120 [†]
Intercept	1.536***	1.210	1.277 [†]	1.464**	1.139	1.189

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ref. = reference category.

^a Sum of chronic health conditions ever had high blood pressure, diabetes, cancer, lung disease, heart problems, stroke, psychiatric problems, or arthritis.

[†] $p < .10$,
* $p < .05$,
** $p < .01$,
*** $p < .001$.