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Racial-ethnic Disparities in Pain Intensity and Interference Among Middle-aged and Older U.S. Adults

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Abstract

Background: This study aims to better understand differing pain experiences across U.S. racial/ethnic subgroups by estimating racial-ethnic disparities in both pain intensity and domain-specific pain-related interference. To address this issue, we use a nationally representative sample of non-Hispanic White, non-Hispanic Black, and Hispanic adults ages 50+ who report recently experiencing pain.

Methods: Using data from the 2010 wave of the Health and Retirement Study (HRS; $N = 684$), we conducted a series of multivariate analyses to assess possible racial/ethnic disparities in pain intensity and 7 domains of pain interference, controlling for relevant sociodemographic variables and other health problems.

Results: Black and Hispanic participants reported higher pain intensity than White participants after controlling for socioeconomic status (SES) and other health conditions. Both Black and Hispanic individuals reported more domain-specific pain interference in bivariate analyses. In multivariate analyses, Black (vs White) participants reported significantly higher levels of pain interference with family–home responsibilities, occupation, sexual behavior, and daily self-care. We did not find significant Hispanic-White differences in the 7 pain interference domains, nor did we find Black-White differences in 3 domains (recreation, social activities, and essential activities).

Conclusions: Our findings highlight the need for using multidimensional measures of pain when assessing for possible pain disparities with respect to race/ethnicity. Future studies on pain interventions should consider contextualizing the pain experience across different racial subgroups to help pain patients with diverse needs, with the ultimate goal of reducing racial/ethnic disparities in pain.

Keywords: Health inequity, Pain interference, Racial/ethnic

There is abundant evidence of racial-ethnic disparities in health, across outcomes including life expectancy, infant and maternal mortality, and the incidence and impact of multiple chronic health conditions (1–4). Chronic pain is a highly prevalent, disabling, and costly public health problem that has received increasing scholarly attention in recent years (5–8). Recent population-based studies show high pain prevalence across all racial/ethnic groups, regardless of the period of data collection, research design (cross-sectional vs longitudinal), or form of pain measurement (9–12). Although earlier studies adopted a biological perspective on evaluating possible racial/ethnic disparities in pain (eg, considering racial differences in tissue damage and genetic factors), recent studies have taken a biopsychosocial-cultural perspective, integrating biological, psychological, as well as social and cultural factors (13,14). To date, studies assessing racial-ethnic disparities in pain intensity and disability, pain treatment, and pain management have yielded conflicting findings (15). It is important to understand racial/ethnic differences in pain experiences to ensure that pain management and treatment can address disparities in pain more effectively.

Recent epidemiological and demographic studies find that at a population level, the prevalence of pain among non-White racial and ethnic groups is similar to that of Whites, or sometimes lower than that of Whites, mirroring the Black-White mental health paradox (16) and the Hispanic health paradox (17). For example, using data from the 2012 National Health Interview Survey (NHIS), Nahin (9) found prevalence rates of reported

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pain to be 59.7%, 53.5%, and 49.3% among non-Hispanic White, non-Hispanic Black, and Hispanic White English-speaking people, respectively. Using the 2002–2018 NHIS for adults aged 25–84 years, Zajacova and colleagues (12) found that White Americans of all ages (including older adults aged 65–84 years) were more likely to report any pain than African Americans, but not other racial and ethnic subgroups. However, when considering change over time, this study found the pain trend for African Americans to be significantly steeper than that for White Americans in the fully-adjusted and fully-interacted models.

Moving beyond dichotomous measures of pain, Grol-Prokopczyk (11) used an ordinal pain variable incorporating pain severity. Based on 12-year longitudinal data from the Health and Retirement Study (HRS), the study found that Black or Hispanic respondents have slightly higher pain severity when compared with White respondents in bivariate analyses. These differences disappeared, and indeed were reversed in multivariable analyses, showing that Black Americans had lower pain scores vis-à-vis White Americans after controlling for socioeconomic status (SES).

More recent studies have further advanced understanding of pain prevalence by examining population-level patterns in high-impact pain (10,18). High-impact pain is defined by the National Pain Strategy (NPS) as pain experienced for over 6 months that causes substantial limitations in work, social, and/or self-care activities (19). Using data from the 2010 HRS, Janevic and colleagues (18) found high-impact pain prevalence to range from 8.0% (non-Hispanic White) to 9.2% (non-Hispanic Black) and 9.1% (Hispanic) among the U.S. population aged 50 years and older. However, after accounting for sex, education, wealth, and other health conditions, the differences across all racial subgroups were not statistically significant.

Dahlhamer and colleagues (10) used 2016 NHIS data to compare the prevalence of chronic pain and high-impact pain across a set of sociodemographic subgroups. Specifically, they found that although a higher percentage of White adults (21.7%) reported chronic pain compared with Black (17.8%) and Hispanic (16.7%) adults, the percentages reporting high-impact pain were similar across the 3 groups. Further, Mexican Americans (a subgroup of the Hispanic/Latinx population) had lower odds of experiencing various chronic pain disorders compared to White and Black Americans, including back pain, leg/foot pain, and regional/widespread pain (20), consistent with other research on the health advantages of immigrants (termed the Hispanic paradox) (17).

Although population-based studies often show no disadvantage, or even an advantage, in pain among non-White racial and ethnic groups, clinical and experimental studies typically come to the opposite conclusion. Moreover, Black participants, and in some cases Hispanic participants, report more pain than their White peers in both clinical (21) and laboratory settings (13,22). The findings from clinical samples fairly consistently demonstrate that African Americans and other non-White racial groups suffer disproportionately from unrelieved pain compared with White individuals (14,21,23,24). With respect to experimentally induced pain, research shows that Black individuals demonstrate a lower pain tolerance and report higher pain intensity and unpleasantness compared to their White peers (24,25). Studies focusing on samples of clinical pain patients also find that Black participants report a greater number of conditions (eg, osteoarthritis) for which pain is a primary symptom; more pain-related functional limitations, disability, and psychological distress (eg, depression and post-traumatic stress disorder); and less control over pain than White participants (15). However, one of the main criticisms of clinical and experimental studies is their lack of generalizability.

Although epidemiological and demographic studies have the advantage of providing more generalizable evidence to characterize pain disparities, little is known about racial-ethnic disparities in the pain *experience*. Given that pain is a multidimensional experience with sensory, affective and cognitive components, using only unidimensional measures (eg, a binary measure, or a numeric pain rating scale) to assess for possible racial/ethnic differences could fail to identify associations in other relevant domains such as degree of pain-related interference.

Indeed, prior research has demonstrated considerable heterogeneity in pain interference in persons with comparable levels of pain intensity, suggesting that other dimensions of pain (eg, pain interference) are of equal or potentially greater importance than pain intensity (26) For example, one recent study found that pain-related interference was associated with cognitive decline, whereas pain intensity was not (27). Therefore, pain assessment should incorporate the impact of pain on function, such as the pain sufferers' ability to perform daily activities, and to participate in activities that bring meaning and purpose, such as pursuing hobbies, spending time with family and friends, and engaging in desired recreational or social activities (28).

To our knowledge, this is the first study to examine racial/ethnic differences in both pain intensity and domain-specific interference among individuals who report recent experiences of pain and are drawn from a nationally representative sample. This research could advance current understandings of racial disparities in the pain experience and test whether findings from clinical and experimental studies (typically finding worse pain experiences among Black and Hispanic individuals) are generalizable to a broader population. We separately examine pain intensity and 7 different domains of pain interference in the Pain Disability Index (29), by analyzing data from a subsample of Health and Retirement Study participants who were randomly selected for a supplementary pain module in 2010. Although Janevic and colleagues (18) used the same dataset to examine disparities in high impact pain, they combined the intensity and pain interference questions into one binary variable (have/do not have high-impact pain). We keep these outcomes separate, to better understand variations in how racial/ethnic groups experience pain and pain-related interference. Our study aims to provide evidence for future intervention studies to reduce pain-related disparities, and for health care providers to help pain patients with diverse needs.

Method

Data

This study is based on secondary analyses of Health and Retirement Study (HRS; http://hrsonline.isr.umich.edu/index.php) data. The HRS is a longitudinal and nationally representative survey of adults over age 50 in the United States. We use the HRS core surveys, a supplemental module on pain, and Income and Wealth Imputation data from RAND in 2010. The supplemental module on pain surveyed a randomly selected subsample of core respondents (N = 1925) for detailed information on pain intensity, pain interference, and pain treatment.

Among the 1925 respondents, 779 affirmatively answered the opening question from the 2010 pain module: "*If you have had more than one week-long or longer episode of pain in the past year, please think about the one that was most severe. The remaining*

questions will be about that episode of pain." We further restricted our sample to respondents ages 50 years or older, as the HRS is only representative of this age group (excluding 41 respondents), and who had no missing data on the sociodemographic variables (excluding 36 respondents). We also excluded 18 respondents who self-identified as "non-Hispanic other races" for 2 reasons: first, this can be a very diverse category, including but not limited to American Indian, Asian Americans, and Pacific Islanders; and second, the subgroup size was too small to provide adequate statistical power. Our exclusion strategy, depicted in Figure 1, yielded an analytical sample of 684 respondents.

Measures

Pain intensity was assessed with a question asking the respondent to report average pain episodes in the last year: "On a 0–10 scale, how would you rate your pain on average?" Higher scores indicate more severe average pain.

Domain-specific pain impact/interference was assessed using all 7 items from the Pain Disability Index (29). Respondents rated the impact of pain on a 0–10 scale, where 0 indicates no disability, and 10 indicates the most disability possible, in the following 7 areas: (i) family/home responsibilities ("Overall, how did that pain affect your family and home responsibilities, such as chores and duties performed around the house and yard, or errands or favors for other family members?"); (ii) recreational activities ("How did that pain affect your recreational activities (including hobbies, sports, and other similar leisure time)?"); (iii) social activities ("How did that pain affect your social activities (eg, activities which involve participation with friends and acquaintances other than family members, parties, theaters, concerts, dining out, and other social functions?"); (iv) occupation ("How did that pain affect your occupation, or your ability to do paid and non-paid work both in and outside the home?"); (v) sexual behavior ("How did that pain affect your sexual behavior (the frequency and quality of your sex life)?"); (vi) self-care ("How did that pain affect your ability to do the basic things for yourself, such as taking a shower, fixing a meal, getting dressed, or driving?"); and finally (vii) essential activities ("How did that pain affect your ability to do essential activities, like eating, sleeping or breathing?")

Pain duration is assessed as the length of the pain episode. In the pain module, participants were asked: "How long did that episode of pain last? Would you say less than one month, 2 to 3 months, 4 to 6 months, seven months to 1 year, or more than one year?" Because we did not find significant variations in pain intensity and interference (i) between less than one month and 2–3 months, and (ii) between 7 months to 1 year and more than 1 year, we collapsed the original 5-category variable into 3 categories: less than 3 months, 4–6 months, and more than 6 months. The 3-category pain duration variable also roughly corresponds to the time thresholds used for operationalizing acute pain (less than 3 months), chronic pain (more than 3 months) (30), and high-impact chronic pain (more than 6 months) (18).

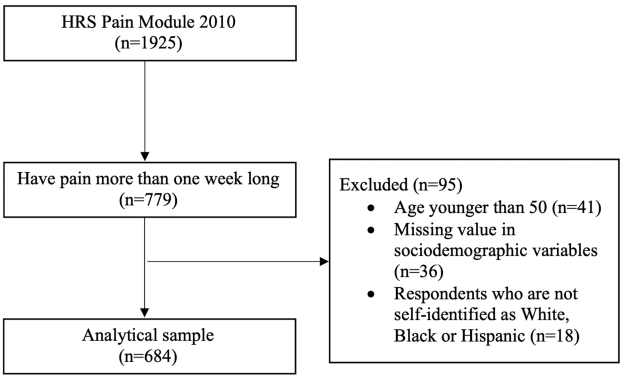

Figure 1. Consort flow diagram.

Race/ethnicity was assessed with 2 questions. First, the survey asked respondents to identify their race from 3 groups: White/Caucasian, Black or African American, and other. HRS then asked participants to specify their Hispanic ancestry (as Mexican, other Hispanic ancestry, Hispanic type unknown, or not Hispanic). If a respondent identified as any type of Hispanic (Mexican, other Hispanic ancestry, Hispanic type unknown), we coded their ethnicity as Hispanic. We combined the 2 questions and generated a race/ethnicity variable with 4 categories: non-Hispanic White, non-Hispanic Black, Hispanic, and non-Hispanic others. After excluding the last group due to its small number (n = 18), as noted earlier, our race/ethnicity variable consisted of the 3 remaining categories. We use the term "Hispanic" instead of other terminologies, for example, Latinx, because this is what was presented to respondents in the HRS question wording.

Health covariates included the number of chronic conditions, the number of depressive symptoms, and obesity status. The number of chronic conditions was measured as a count of the following diagnoses: (i) hypertension; (ii) diabetes; (iii) non-skin cancer; (iv) lung diseases; (v) coronary heart disease; (vi) congestive heart failure; (vii) stroke; and (viii) arthritis. The number of depressive symptoms was measured with the 8-item version of the Center for Epidemiologic Studies Depression scale (31). Respondents reported whether they experienced the following symptoms much of the time over the week preceding the survey: felt depressed, felt lonely, felt sad, felt everything was an effort, had restless sleep, could not get going, was happy (reverse-coded), and enjoyed life (reverse-coded). The Cronbach's α is 0.811, indicating relatively high internal reliability. We thus created a total score by summing the number of symptoms identified by each respondent. Higher scores indicate more depressive symptoms. Obesity was a dichotomous measure of whether body mass index was above 30.

Sociodemographic covariates included age, sex, marital status, number of living children, education, wealth quartiles, and whether currently working for pay (Table 1). RAND calculated wealth data (and imputed variables with missing values) based on questions on owning stocks and/or mutual funds, and on the value of the respondent's primary residence, mortgages, home loans, equity lines of credits, and debt. We prefer wealth to income as a measure of SES in our study because the latter may not accurately capture economic standing in a population with mixed retirement statuses (32). Following previous research (11), we recoded wealth into quartiles based on the full HRS sample in 2010 to convey relative economic standing vis-à-vis the population at large.

Analytical Strategy

We first present the sample characteristics for the 3 racial and ethnic groups: non-Hispanic White, non-Hispanic Black, and Hispanic (Table 1). To test whether each individual variable differs significantly across 3 groups, we performed 1-way analysis of variance (ANOVA) tests for continuous variables and chi-squared tests for categorical variables. Because all our outcome variables are continuous, we subsequently performed a series of multivariable ordinary least square

Table 1. Unweighted Sample Characteristics (*N* = 684; from 2010 Health and Retirement Study)

	White (*N* = 494)		Black (*N* = 123)		Hispanic (*N* = 67)		
	Mean or %	*SD*	Mean or %	*SD*	Mean or %	*SD*	Sig.
Pain intensity (0–10)	4.94	2.05	5.95	2.33	5.97	2.02	***
Pain impact on							
Family-home (0–10)	5.32	3.20	6.90	3.16	6.13	3.16	***
Recreation (0–10)	6.32	3.42	7.00	3.47	7.09	3.14	*
Social (0–10)	5.29	3.67	6.57	3.68	5.84	3.63	**
Occupation (0–10)	4.93	3.98	6.89	3.82	6.40	3.32	***
Sex activities (0–10)	4.43	4.32	6.14	4.21	5.05	4.37	***
Self-care (0–10)	3.83	3.57	5.68	3.58	5.02	3.44	***
Essential activities (0–10)	2.88	3.30	4.29	3.62	4.42	3.47	***
Duration of pain							
3 months and less (ref.)	56.88		62.60		58.21		
4–6 months	8.70		5.69		7.46		
7 months and above	34.41		31.71		34.33		
Age							***
50–59 years (ref.)	26.72		47.97		46.27		
61–69 years	29.96		29.27		25.37		
70–79 years	26.92		17.89		19.40		
80+ years	16.40		4.88		8.96		
Sex (female = 1)	59.11		68.29		71.64		*
Marital status (married = 1)	63.56		33.33		49.25		***
Number of living children (0–18)	2.98	2.00	3.57	2.29	3.45	2.27	**
Education							***
No degree	10.32		28.46		41.79		
High school degree (ref.)	65.18		57.72		46.27		
Four-year college or above	24.49		13.82		11.94		
Wealth quartile[a]							***
Quartile 1 (ref.)	17.21		47.97		56.72		
Quartile 2	22.06		32.52		22.39		
Quartile 3	24.29		13.01		17.91		
Quartile 4 (wealthiest)	36.44		6.50		2.99		
Work for pay	29.55		26.83		32.84		
Number of chronic conditions (0–6)	2.40	1.40	2.50	1.39	2.13	1.32	
Number of CESD symptoms (0–8)	1.90	2.15	2.39	2.34	2.81	2.62	**
Obesity (BMI > 30)	37.45		54.47		40.31		**

Notes: ADL = activities of daily living; BMI = body mass index; CESD = Center for Epidemiologic Studies Depression scale..

[a]Wealth quartiles were not exactly 25% each, because they were created using the full HRS sample rather than only the analytical sample.

*$p < .05$, **$p < .01$, ***$p < .001$.

(33) regressions to estimate racial/ethnic differences in pain intensity and in the 7 specific domains of pain interference after controlling for potentially confounding factors, such as SES and other health conditions (Table 2).

The HRS survey uses a multistage clustered survey design. We used sampling weights to account for this complex survey design to make our results representative of the U.S. age 50+ population. Therefore, in addition to the unweighted results in Table 2, we also performed regressions with sample-weight adjustment to generalize our findings to 50+ population (Supplementary Table A). Each individual has a weight that was calculated and assigned by HRS team based on the individual's representation in the population of the United States. Specifically, HRS used the Current Population Survey and the American Community Survey to poststratify sampling weights to the U.S. population for a given survey wave (34). There is an ongoing debate about whether to use survey weights in multivariable analyses (35) because weighted models are generally less efficient (ie, have larger standard errors). Therefore, we presented the unweighted results in Table 2 and weighted results in Supplementary Table A. All the analyses were performed by using Stata 16 SE, and the *svy* command was used for sample-weight adjustment in the regression analyses.

Results

Table 1 presents all key variables for the 3 racial/ethnic groups: non-Hispanic White (*N* = 494, 72%), non-Hispanic Black (*N* = 123, 18%), and Hispanic (*N* = 67, 10%). Black and Hispanic respondents reported a significantly higher level of pain intensity (mean = 5.95, *SD* = 2.33 for Black respondents; mean = 5.97, *SD* = 2.02 for Hispanic respondents) than their White counterparts (mean = 4.94, *SD* = 2.05). Moreover, White participants reported less impact of pain across all 7 interference domains, including family/home life, recreational activities, social activities, occupation, sex behavior, self-care, and essential activities. The ANOVA significance tests show that racial/ethnic differences in pain intensity were statistically significant in bivariate analyses. There was no significant difference among the 3 racial/ethnic groups in terms of pain duration. Regarding sociodemographic characteristics, we found that Black and Hispanic participants were younger, more

Table 2. OLS Regression of Pain Outcomes (HRS 2010: *N* = 684; Unweighted)

		Race (ref.: White)				Model fit
		Black		Hispanic		
	Outcomes	Coef.	*SE*	Coef.	*SE*	R^2
Model 1	Pain intensity	**0.73****	0.23	**0.75****	0.29	0.13
Model 2	Pain interference: Family/home	**0.73***	0.34	0.05	0.43	0.16
Model 3	Pain interference: Recreation	0.05	0.38	0.11	0.47	0.07
Model 4	Pain interference: Social	0.40	0.39	−0.28	0.5	0.12
Model 5	Pain interference: Occupation	**1.04***	0.42	0.5	0.54	0.16
Model 6	Pain interference: Sex activities	**1.21***	0.48	−0.19	0.63	0.10
Model 7	Pain interference: Self-care	**0.77***	0.37	0.08	0.47	0.19
Model 8	Pain interference: Essential	0.52	0.36	0.62	0.46	0.16

Notes: *$p < .05$, **$p < .01$, ***$p < .001$. All the models adjust for age, sex, marital status, number of living children, highest education level, wealth quartiles, whether currently working for pay, number of chronic conditions, depression symptoms (CES-D), whether BMI is greater than 30, and pain durations. Full models are available upon request..

likely to be female, not married, had more children on average, were less educated, and were less wealthy than White participants. Although there was no significant difference in the number of chronic conditions among the 3 groups, Black and Hispanic participants were more likely to suffer higher levels of depressive symptoms and to be obese (2 common comorbidities strongly associated with chronic pain (36)).

Table 2 presents a series of unweighted OLS regression results for pain intensity and the 7 specific domains of pain interference. Both Black and Hispanic participants reported greater levels of pain intensity ($B_{Black} = 0.72$, $p < .05$; $B_{Hispanic} = 0.75$, $p < .05$), on average, than their White counterparts, even after controlling for pain duration, sociodemographic covariates, and other health covariates in Model 1. Women reported significantly more pain intensity, while those with college degrees and those currently working for pay reported less pain intensity. Each additional chronic condition was marginally significantly associated with an increase in pain intensity of 0.11 units. Each additional depressive symptom was significantly associated with an increase in pain intensity of 0.07 units. Compared with acute pain (duration less than 3 months, mean = 5.01, *SD* = 2.11), we found participants suffered significantly more intense pain ($p < .05$, 2-tailed *t*-test) when the duration of pain exceeded 3 months (mean = 5.53, *SD* = 2.15).

Among the 7 domains of pain interference, we found that Black pain sufferers reported significantly greater pain-related interference in the areas of family/home responsibilities (Model 2), occupation (Model 5), sex behavior (Model 6), and self-care activities (Model 7). We found no significant racial/ethnic differences in the other domains, including pain-related disruption of recreational activities (Model 3), social activities (Model 4), and essential activities (Model 8). There were no White-Hispanic differences in any of the 7 domains in the multivariable models. We also found an SES-interference gradient. For example, in Models 2, 4, 5, 7, and 8, college graduates reported significantly less impact of pain on their family life, social life, work, self-care, and essential activities than high school graduates. The results also showed that members of the higher wealth quartiles reported significantly less impact of pain across the 7 domains. Depressive symptom scores were positively and significantly associated with a higher level of pain impact in all 7 domains.

Supplementary Table A1 shows the findings using Black participants as the reference group. It shows no significant Black-Hispanic differences in pain intensity and interference except for lower levels of interference with sexual behaviors among Hispanics. Supplementary Table A2 shows that our findings were similar in terms of direction and significance level when we performed regression analyses adjusting for the sampling weight, except for the self-care outcome, which was not statistically significant in weighted analyses. As mentioned above, applying sampling weights can yield findings that are more generalizable to the broader population. Based on the weighted models, our estimations reflect the racial/ethnic disparities in pain among approximately 3 million people in the United States.

Discussion

Using data from a nationally representative survey of American adults over 50 years old, this study examined racial-ethnic disparities in pain intensity and pain-related interference among individuals with pain, to better understand racial/ethnic differences with respect to their pain experiences. Prior epidemiological and demographic research has found pain prevalence either to be similar across racial/ethnic subpopulations or to be higher among non-Hispanic Whites (9–11,18). However, in our study focusing exclusively on people with recent pain episodes, we found that Black and Hispanic pain sufferers reported significantly higher pain intensity than White individuals. This finding is consistent with population-level research that *conditional* on having pain, Black and Hispanic respondents are more likely to report severe pain compared to their White peers (11,37). Moreover, in bivariate analyses, we found that Black and Hispanic individuals reported relatively high levels of pain interference and significantly more interference than White participants (Table 1), consistent with prior research findings on racial-ethnic differences in osteoarthritis pain and interference (15).

Our multivariable regression results showed that racial/ethnic disparities in pain intensity are significant even after controlling for SES and other health confounders, and after adjusting for sampling weights. Moreover, our findings also showed that African Americans reported significantly more pain interference in their family/home, occupation, sexual behavior, and self-care than their White peers persisted even after holding these factors constant. These findings provide evidence at the population level to support findings from small/convenience samples in clinical and laboratory settings (14,15,22). Several factors may contribute to disparities in pain management, including physician–patient interaction and practice styles, prescribing behaviors, patient perception, previous experiences with pain, attitudes, beliefs and behaviors regarding pain, and patient access to pain care, including effective analgesics (14). We elaborate on these factors as follows:

First, multiple studies have documented unequal access to and quality of healthcare among Black and Hispanic pain patients (38,39). For example, Black and Hispanic pain patients are more likely to have their pain underestimated and undertreated by providers (eg,

being rated as experiencing less pain by a physician, receiving fewer opioid analgesic treatments) (40). Moreover, different from White pain patients who are more likely to use surgical interventions for pain treatment, strategies used by Black and Hispanic patients to cope with pain are more likely to be conservative and often depend on the individual's view of pain as a threat, as well their perceptions of their ability to cope with pain (14,23,41). Research has found a lower preference rate for seeking joint replacement surgery among Black patients than their White peers (42,43), that is, they may be more reluctant to undergo pain-relieving surgeries such as hip and knee joint replacements (44). Studies also document that African Americans are less willing to seek treatments for pain-related mental health disorders (45). Limited access to high-quality pain treatment or management, therefore, can increase pain intensity and physical interference due to pain, as well as impair functioning in the domains of family/home, occupation, sexual behavior, and self-care.

Second, culturally specific attitudes and beliefs about the origin, role, and meaning of pain influence the manner in which individuals view and respond to their pain (14). For instance, African (vs White) Americans are more likely to use and believe that prayer is a more efficacious method of self-treating knee or hip pain (46). This approach could help relieve the psychological and emotional burden of pain, but it may be associated with greater pain severity and interference among African American pain sufferers than their White peers (47,48). In addition, some Black and Hispanic adults may be more likely to place a high value on intergenerational households and extended family engagement. Therefore, compared with their White peers, Black and Hispanic older adults are more likely to provide active child care and to perceive it as a way to support their family (49–52). It is possible that Black and Hispanic middle-aged and older adults with pain might find it particularly challenging to maintain their roles in family engagement and functioning.

Third, the role of residential segregation has been identified as a primary institutional mechanism of racism and a fundamental racial disparity affecting health (13). Research using geographic information found that pharmacies in the neighborhood with 70% or more White residents were more likely to have sufficient opioid analgesic supplies than those neighborhoods with 70% or more non-White residents, and these racial-ethnic differences in the odds of having a sufficient supply were significantly higher in low-income neighborhoods than high-income areas (53). Therefore, people living in a predominantly minority neighborhood may experience significant barriers to accessing pain medication, with greater disparities in low-income areas. Moreover, neighborhoods with a higher percentage of Black or Hispanic residents are more likely to lack green space and recreational facilities, which operate as barriers to engaging in physical activity. Neighborhoods high in physical and social disorder may also contribute to both physical and social isolation, as well as increased stress, all of which have been found to negatively affect the pain experience (54). Therefore, African Americans living in disadvantaged neighborhoods might be more likely to experience disruption of pain on their activities, compared to those who live in neighborhoods with more recreational resources.

Fourth, beyond institutional racism, daily and lifetime discrimination may also negatively affect Black and Hispanic middle-aged and older adults with pain. Researchers have found that perceived discrimination based on race, ethnicity, disability, religion, and other characteristics could increase pain through psychological distress (55). Although we did not have data on perceived racial/ethnic discrimination to test this mechanism, there is support from previous research that perceived racial/ethnic discrimination is *indirectly* related to pain intensity and interference through anxiety sensitivity among economically disadvantaged Latinx (56).

Lastly, it is not surprising that Black individuals experienced more pain interference as they suffered more intense pain. In fact, after controlling for pain intensity in the linear regression models, there were no significant differences across 3 racial/ethnic groups (table not shown). Although the differences in pain intensity between White, Black, and Hispanic individuals persist, the White-Hispanic differences on 7 domains of interference and the White-Black differences on 3 domains of interference (recreational, social, and essential activities) are not statistically significant after controlling for sociodemographic covariates and other health covariates. These results are in contrast to the findings that Black and Hispanic participants reported more intense pain than White participants. However, these nonsignificant results do not mean an absence of racial-ethnic disparities in pain interference in certain domain, but might be related to the use of different coping strategies among Black and Hispanic individuals with pain that help to mitigate the pain interference according to the environmental affordance perspective, which has been used to explain the Black-White mental health paradox (57).

This study has several limitations that warrant consideration. First, due to the relatively small number of Hispanic respondents (N = 67), we may have lacked statistical power to detect differences compared to White respondents. Second, this study used a cross-sectional design, because the pain module in HRS was only conducted in 2010, thus future research could explore the longitudinal dynamics of pain intensity and domain-specific pain interference among different racial/ethnic groups. Third, this study could not assess for possible disparities in pain intensity and interference among other racial groups such as Asian Americans and Native Americans because of their small sample sizes. We encourage future research to include these subgroups as they might have different experiences with pain intensity and pain-related interference. Fourth, we do not have sufficient data to test possible mechanisms underlying the observed racial/ethnic differences in pain intensity and interference. Future research is needed to examine pathways and provide possible solutions to reduce the unequal burden of pain among Black and Hispanic older adults. Fourth, although the pain measures in our study do not specify the location of pain, they are likely to reflect musculoskeletal pain, given that respondents reported high levels of arthritis and back pain.

In sum, our findings provide a better understanding of the population in need of pain services, by calculating the national estimates of pain intensity and interference in major life domains (eg, work, social, recreational, and self-care activities) among White, Black, and Hispanic Americans ages 50 and above who have experienced recent pain. Clinicians should be aware that, on average, Black and Hispanic Americans experience greater pain intensity and pain-related interference than White Americans. These racial/ethnic disparities in pain intensity, and some of the differences in pain interference, remain salient even after controlling for sociodemographic characteristics and other health conditions, suggesting that pain takes a more substantial toll on Black pain sufferers. Therefore, further study is needed to consider the factors or mechanisms driving these patterns in each racial and ethnic population. Indeed, it is critical to consider the different social conditions and experiences of each group. We suggest that future studies on pain and pain intervention consider the diverse needs and experiences of racial/ethnic groups, with the ultimate goal of reducing racial/ethnic disparities in pain and pain-related interference.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences* online.

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Author Contributions

Y.Y. performed all statistical analyses and drafted the manuscript. H.G.-P., M.C.R., and K.P. supervised the data analysis and contributed to revising the manuscript.

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Conflict of Interest

None declared.

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