


# Examining the Association of Pain and Financial Hardship Among Older Men by Race in the United States

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## Abstract

Pain associated with financial hardship among older men varies by race. The purpose of this study was to examine the association of financial hardship with the presence of pain in men 50 years and older by race. Using the Health and Retirement Study (HRS) 2010 wave, bivariate and multivariate logistic regression models were used to assess the association between four financial hardship indicators and total financial hardship as a composite score, and the presence of pain by race. Among White men, the association between the presence of pain and hardship controlling for demographic factors was statistically significant across four indicators and one composite score: ongoing financial hardship (OR = 1.29, 95% CI [1.02, 1.64]), food insecurity (OR = 2.55, 95% CI [1.51, 4.31]), taking less medication due to cost (OR = 2.12, 95% CI [1.40, 3.22]), difficulty paying bills (OR = 1.36, 95% CI [1.07, 1.73]), and total financial hardship (OR = 1.27, 95% CI [1.12, 1.44]). Among African American men, the association between the presence of pain and taking less medication due to cost (OR = 2.99, 95% CI [1.31, 6.85]) was significant. With increasing comorbidities among older adults, particularly African Americans, it is imperative to fully understand the mechanisms of this underexplored area in both the pain and financial hardship literature.

## Keywords

financial hardship, men, presence of pain, race

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The prevalence of pain among older Americans is a serious public health concern. While increased attention is being given to how pain impacts older adults, there remains a dearth of information on this subject. This is a concern since the proportion of adults aged 65 years and older is expected to increase to more than one fifth of the total U.S. population within the next decade (National Academies of Sciences, Engineering, and Medicine, 2018; Ortman et al., 2014). Some evidence suggests that pain disproportionately affects older adults, especially among minority populations and those experiencing financial hardship (Janevic et al., 2017; Zimmer & Zajacova, 2020). While we know that pain is perceived, assessed, and treated differently depending on a person's sex, race/ethnicity, and age (Wandner et al., 2012), the causal linkages behind these differences are not yet completely understood. These disparities warrant further research especially among men,

who are underrepresented in the literature (Robinson & Wise, 2004), and tend to report less pain than women (Campbell et al., 2005). The goal of this paper is to examine the association of financial hardship with the presence of pain in men 50 years and older by race.

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## Older Adults, Men, and Pain

Pain is most common among older adults and remains a public health burden with more than two-thirds of older Americans reporting that they experience chronic pain (Ho et al., 2016; Johannes et al., 2010; Jones et al., 2016; Marshall et al., 2018; Nahin, 2015; Wandner et al., 2012). Older adults are more likely to report multiple chronic pain-related conditions (Ward et al., 2014), such as osteoarthritis, diabetic neuropathy, post-herpetic neuralgia, and lower back pain (Jones et al., 2016). However, compared to their younger counterpart, the pain perception—that is, pain intensity, duration, and locations—experienced by older adults is underreported and undertreated (Wandner et al., 2012). This is in part due to the low rate of routine screening for identifying pain at the system level and low rate of reporting pain based on the assumption that chronic pain occurs as an inevitable part of the aging process at the individual level (Chodosh et al., 2004).

Although significant progress has been made in research on the impact of stress on pain based on stress process (Pearlin et al., 1981) or cumulative disadvantage (Dannefer, 2003) theory (Byrd et al., 2020), evidence regarding the pain experience among older men is scarce and conflicting. Findings suggest that on average men report lower pain prevalence, lower pain sensitivity (Campbell et al., 2005), and are less likely to have two or more chronic pain conditions compared to women (Johannes et al., 2010; Ward et al., 2014). Men have a higher pain threshold and tolerance to experimental pain stimuli (e.g., mechanical, electrical, thermal, ischemic, and chemical stimuli) relative to women (Bartley & Fillingim, 2013; Wandner et al., 2012). Underlying causes for these sex differences are still inconclusive and likely quite complex. Although evidence is still limited, emerging research begins to illuminate that both genetic and psychosocial differences between men and women may yield sex differences in pain perception and reporting (Hashmi & Davis, 2014).

Findings from large-scale epidemiological studies across multiple geographic regions suggest that males tend to have a higher pain tolerance compared to females. One study reported that sex differences in clinical pain sensitivity among young adults were significant for all pain measures, including heat pain threshold, heat pain tolerance, ischemic pain threshold, ischemic pain tolerance, cold pain threshold, cold pain tolerance, pressure pain tolerance, cold pain threshold, cold pain tolerance, pressure pain threshold at the trapezius muscle, pressure pain threshold at the masseter muscle (Campbell et al., 2005). When we consider age, one study reported that older men were less likely to display pronounced pain during physical activity compared to older women (Ho et al., 2016). Yet other systematic reviews only prove that

these sex differences exist for certain types of pain measures, finding variability between types of pain tolerance. Another potential explanation for why less men report pain may be because they are less likely to go to the doctor (Schlichthorst et al., 2016). Multiple studies have reported that women utilize health-care services at rates exceeding those of men (Mogil, 2012; Schlichthorst et al., 2016). This could explain why women are more likely to be engaged in health-care services, and consequently more likely to respond to questions about pain. Nonetheless, it is generally assumed that men have a higher pain threshold and experience less temporal summation of pain to brief, repeated, or dynamic stimuli than women (Hashmi & Davis, 2014).

Previous studies suggest that the variability in socioeconomic status (SES) and psychosocial characteristics is also known to significantly influence the pain experience. However, less is known about the intersection of race, gender, and pain, particularly among older minority men (Green & Hart-Johnson, 2010). Prior research also indicates that men from diverse racial and ethnic backgrounds tend to have limited resources, experience increased functional impairment associated with their pain-related diagnosis, and encounter substantial barriers when seeking care for their pain (Cook et al., 2013; Hayward et al., 2000; Welch et al., 2005). For instance, in one study, being Black was a predictor of greater pain distress and an indirect indicator of disability, affective distress, posttraumatic stress, and depression among Black and White men (Green & Hart-Johnson, 2010). Particularly among Black men, social factors (e.g., perceived discrimination) in conjunction with mental health predictors have been identified as a chronic stressor to influence bodily pain (Burgess et al., 2009). Despite various examples suggesting pain variability, there still remains a lack of clarity in how pain is expressed among men and men of color in particular.

## Pain and Financial Hardship

One of the main risk factors for debilitating pain is financial hardship. Numerous studies reporting a higher prevalence of pain among people with lower SES (Janevic et al. 2017; Rahavard et al., 2017; Rios & Zautra, 2011) document an association between lower SES and higher frequency of reporting musculoskeletal pain, and pain intensity and physical disability (Rios & Zautra, 2011). In the United States alone, the pain prevalence for the entire population is 8.2% (Janevic et al., 2017). However, there is a significant difference in the pain prevalence by wealth: the smallest wealth quartile group (17.1%) has nearly tripled in their prevalence of pain compared with the largest wealth quartile group (5.6%) (Janevic et al., 2017). These findings were consistent across other studies, with additional research reporting that daily financial

worry was associated with daily pain across diagnostic groups with different types of pain (Rios & Zautra, 2011).

The costs associated with addressing pain in the United States are expensive and continue to rise. The direct medical costs for certain pain-related medical conditions range from \$45.7 billion for moderate pain to \$89.4 billion for severe pain (Gaskin & Richard, 2012). Annual incremental health-care costs for joint pain being the most prevalent range from \$261 billion to \$300 billion (Gaskin & Richard, 2012). Moreover, indirect costs associated with pain, such as loss of employment and the resultant income instability, are even greater, laying enormous economic burden on individuals, employers, health-care systems, and society. Previous findings suggest that women were more likely to report higher health-care expenditures than men (Gaskin & Richard, 2012). Yet, despite these findings, less attention has been paid on the (in)direct costs of the pain and health outcomes among older men diagnosed with chronic medical illness. It is well established that financial hardship has a wide range of negative impacts on health and adaptation in both chronic pain and population samples (Rios & Zautra, 2011). However, empirical evidence on the influence of financial hardship on pain among chronic pain sufferers is sparse and even more limited among men and men of color. A review of the literature of both acute and chronic pain concluded that racial and ethnic differences in the occurrence and outcomes of clinical acute and chronic pain have not been sufficiently studied in the United States (Rahavard et al., 2017).

Given the lack of consistent findings and adequate information on pain associated with financial hardship among minority populations, the present study provides a significant contribution to our knowledge of the mechanisms through which the pain experience intertwines with economic hardship in late adulthood by comparing White and African American older men. This study is among the first to report and evaluate racial differences in pain associated with financial hardship among older men by testing the association stratified by race. Building on prior work (Marshall et al., 2018) where we identified a statistically significant association between four indicators of hardship and pain among men in general, we now attempt to test this relationship stratified by race. This study examined the association of financial hardship on the presence of pain in men 50 years and older by race.

## Methods

### *Health and Retirement Study Data*

Data were drawn from the 2010 wave of the Health and Retirement Study (HRS). The HRS is a nationally

representative sample of noninstitutionalized U.S. adults aged 50 years and older to investigate individual's economic well-being and health (Fisher & Ryan, 2018). The first wave of data for HRS was collected in 1992, and participants were interviewed every 2 years thereafter (Sonnega et al., 2014). The biennial HRS core interviews and mail surveys have been conducted by the Institute for Social Research at the University of Michigan (Sonnega et al., 2014). To minimize the attrition rate, the HRS study staff make great efforts to maintain rapport with the study respondents by providing financial payment that is not intended as compensation but as tokens of appreciation to their participation (details can be accessed at <https://hrs.isr.umich.edu/documentation/survey-design/hrs-respondent-incentive-token-amounts>), as well as sending them newsletters and holiday cards (Fisher & Ryan, 2018). The HRS includes, but not limited to, information on demographics, economic status, physical health, psychological well-being, health-care utilization, and work history factors (Levy, 2015). Using a multi-stage area probability sampling scheme, the HRS sample is designed to represent the noninstitutional U.S. population, with oversampling of African Americans, Hispanics, and Florida residents (Heeringa & Connor, 1995). In 2006, the Leave-Behind Questionnaire, a self-administered questionnaire left with respondents upon the completion of an in-person core interview, was added to the core HRS survey to collect detailed information on the respondent's psychosocial experiences (Smith et al., 2017). A detailed description of the survey design, sample weights, and the data collection procedures is available elsewhere (Fisher & Ryan, 2018; Heeringa & Connor, 1995; Levy, 2015; Ofstedal et al., 2011; Smith et al., 2017; Sonnega et al., 2014).

### *Study Sample*

Our study sample from the 2010 wave of the HRS was restricted to men aged 50 years and older who completed the Leave-Behind psychosocial questionnaire. Psychosocial information was obtained at each biennial wave of the HRS and collected from a random 50% of the core panel of participants who completed the face-to-face interview (Smith et al., 2017). Once completed, participants were asked to mail their Leave-Behind psychosocial lifestyle questionnaire to the HRS study office. To avoid bias caused by the missing data, the present study used complete cases with non-missing values across the study variables. Our final sample for subsequent analyses included 2883 men: White ( $N = 2494$ ; 86.5%) and African American ( $N = 389$ ; 13.5%). One concern might be that the relatively smaller sample size of African American men compared with White men may lead to

larger standard errors, thereby yielding biased estimates of the parameters of interest. Individual-level sample weights were applied to all analyses to address the potential bias due to the relatively low sample size of the subgroup (i.e., African American men) in the HRS, thereby yielding unbiased and consistent estimates (Fisher & Ryan, 2018; Sonnega et al., 2014).

## Measures

**Dependent Variable: Pain.** Pain was assessed using one item measuring the presence of pain. The presence of pain was assessed by asking the question "Are you often troubled with pain?" Responses were dichotomized (no = 0; yes = 1).

**Independent Variable: Financial Hardship.** Our independent variable, financial hardship, was operationalized using four indicators: (1) ongoing financial strain, (2) food insecurity, (3) taking less medication due to cost, and (4) difficulty paying bills. These four items from the HRS were selected because they are the most commonly used to capture both objective and subjective aspects of financial hardship based on previous empirical studies on economic/material hardship (Barrera et al., 2001; Beverly, 2001; Carle et al., 2009; Heflin et al., 2009; Kahn & Pearlin, 2006; Levy, 2015; Marshall, 2015; Marshall & Tucker-Seeley, 2018; Short, 2005; Tucker-Seeley et al., 2016; Wilkinson, 2016). *Ongoing financial strain* was operationalized with the question "If you ever had current or ongoing financial problems that have lasted twelve months or longer, how upsetting has it been to you?" (no, didn't happen = 1, yes, but not upsetting = 2, yes, somewhat upsetting = 3, yes, very upsetting = 4). Responses were dichotomized (no, didn't happen = 0; yes, but not upsetting/yes, somewhat upsetting/yes, very upsetting = 1). *Food insecurity* was assessed with the question "In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?" (no = 0; yes = 1). *Taking less medication due to cost* was operationalized with the question "At any time, have you ended up taking less medication than was prescribed for you because of the cost?" (no = 0; yes = 1). *Difficulty paying bills* was assessed with a 5-point Likert-type question "How difficult is it for you to meet monthly payments on your bills?" (not at all difficult = 1, not very difficult = 2, somewhat difficult = 3, very difficult = 4, completely difficult = 5). Responses were dichotomized (not at all difficult = 0, not very difficult/somewhat difficult/very difficult/completely difficult = 1). In addition, total financial hardship was assessed by making a composite score based on four financial hardship indicators (range: 0–4;  $M = 1.2$ ,  $SD = 0.9$ ).

## Control Variables

The selection of our control variables was based on previous work (Marshall et al., 2018). Control variables included sociodemographic factors such as age, income, education, marital status, and insurance. Age was treated as a continuous variable (range: 50–99;  $M = 68.0$ ,  $SD = 10.4$ ). Income was assessed as an income-to-needs ratio (INR) (range: 0–76.3;  $M = 5.3$ ,  $SD = 5.4$ ). The INR equal to or below 1 indicates that an individual is poor, according to the U.S. Census Bureau's definition of poverty. The ratio was computed by dividing annual family income by family size adjusted poverty threshold in prior year (i.e., 2009 for the HRS 10 wave) (Bugliari et al., 2019). Education was assessed as a categorical variable (high school graduate = 0, less than high school graduate = 1, some college or more = 2). Marital status was measured as a categorical variable (married = 0, separated/divorced/widowed = 1, single = 2). Insurance was based on a binary variable indicating whether respondents had Medicare coverage (no = 0, yes = 1).

## Statistical Analysis

Percentages, means, and standard deviations were computed for pain, financial hardship, and sociodemographic factors. Using a series of unadjusted logistic regressions, the association of four financial hardship variables and one total financial hardship with the presence of pain was tested for White and African American men. Using a series of adjusted multivariable logistic regression, the relationship between financial hardship and the presence of pain was stratified by race, while controlling for sociodemographic factors. All analyses were estimated using STATA 14.0 (StataCorp, 2015).

## Results

### Sample Characteristics

Descriptive statistics of men aged 50 and over who had no pain and mild/moderate/severe pain by race are presented in Table 1. Overall, about one-third of men ( $N = 973$ ; 33.9%) reported having pain. African American ( $N = 127$ ; 32.6%) men were less likely to report having pain compared to their white counterparts ( $N = 846$ ; 33.9%).

Men with pain had a mean INR of 4.5 ( $SD = 4.5$ ), which was less than those with no pain, 5.7 ( $SD = 5.8$ ). This means that men with pain had about five times higher mean income than the federal poverty line, whereas those with no pain had about six times higher mean income than the federal poverty line. Thus, on average, men with pain are 0.83 times economically worse off than those with no pain. Across races, among men with

**Table 1.** Sample Characteristics by Race and Level of Pain ( $N = 2883$ ).

Variables	White Men ( $N = 2494$ )				African American Men ( $N = 389$ )			
	No Pain ( $N = 1648$ )		Pain ( $N = 846$ )		No Pain ( $N = 262$ )		Pain ( $N = 127$ )	
	N (%) or Mean (SD)		N (%) or Mean (SD)		N (%) or Mean (SD)		N (%) or Mean (SD)	
<b>Financial Hardship</b>								
Total financial hardship (composite score, 0–4)	1.0	(0.9)	1.3	(1.0)	1.6	(1.4)	1.8	(1.5)
Ongoing financial strain								
No	1,033	(59.2%)	456	(51.6%)	109	(40.5%)	44	(41.0%)
Yes	615	(40.8%)	390	(48.4%)	153	(59.5%)	83	(59.0%)
Eat less because of not enough money								
No	1,592	(96.7%)	790	(91.0%)	224	(84.8%)	100	(77.9%)
Yes	56	(3.3%)	56	(9.0%)	38	(15.2%)	27	(22.1%)
Take less medication because of cost								
No	1,557	(94.6%)	758	(87.6%)	233	(86.6%)	96	(70.6%)
Yes	91	(5.4%)	88	(12.4%)	29	(13.4%)	31	(29.4%)
Difficulty paying bills								
No	834	(47.6%)	349	(38.5%)	76	(26.8%)	31	(29.6%)
Yes	814	(52.4%)	497	(61.5%)	186	(73.2%)	96	(70.4%)
<b>Sociodemographic Factors</b>								
Age (years)	65.0	(8.6)	65.7	(8.7)	64.0	(11.3)	63.9	(12.3)
Income-to-needs ratio	6.6	(5.8)	5.2	(4.5)	4.4	(6.9)	2.8	(2.8)
Education								
Medium (12 years)	506	(29.3%)	270	(29.8%)	69	(27.1%)	51	(36.7%)
Low (0–11 years)	202	(9.6%)	148	(15.6%)	81	(31.4%)	36	(26.6%)
High (13+ years)	940	(61.1%)	428	(54.6%)	112	(41.5%)	40	(36.7%)
Marital Status								
Married/Partnered	1,281	(75.0%)	654	(74.6%)	152	(52.8%)	67	(53.5%)
Separated/Divorced/Widowed	74	(7.2%)	38	(7.1%)	19	(10.8%)	15	(17.4%)
Single (Never Married)	293	(17.8%)	154	(18.4%)	91	(36.4%)	45	(29.1%)
Have Medicare Coverage								
No	653	(54.6%)	252	(41.8%)	138	(51.7%)	53	(42.7%)
Yes	995	(45.4%)	594	(58.2%)	124	(48.3%)	74	(57.3%)

Note. Sample counts ( $N$ ) are unweighted. Percentages and means are weighted by HRS individual-level sampling weights. Pain group refers to people with mild/moderate/severe pain.

pain, African American men were 0.54 (2.8/5.2) times economically worse off than White men; African American men ( $N = 40$ ; 36.7%) were less likely to report having higher education (13 years and more) compared with White men ( $N = 428$ ; 54.6%). Among men with pain, African American men ( $N = 67$ ; 53.5%) were less likely to report being married/partnered than White men ( $N = 654$ ; 74.6%).

Compared to White men with pain, African American men with pain had higher scores in all hardship indicators as well as total financial hardship. African American men with pain ( $M = 1.8$ ) had experienced more total financial hardship compared with White men with pain ( $M = 1.3$ ) by 38.5% (1.8/1.3 - 1). African American men with pain were more vulnerable to experiencing *ongoing financial*

*strain* ( $N = 83$ ; 59.0%); *food insecurity* ( $N = 27$ ; 22.1%); *taking less medication due to cost* ( $N = 31$ ; 29.4%); and *difficulty paying bills* ( $N = 96$ ; 70.4%). Compared to White men with pain ( $N = 594$ ; 58.2%), African American men with pain had lower rate of insurance ( $N = 74$ ; 57.3%). For additional sociodemographic information, see Table 1.

### Association Between Pain and Financial Hardship

Unadjusted and adjusted regression results for the presence of pain by each financial hardship variable and total financial hardship for all older men are presented in Table 2. First, results in the first column of Table 2 indicate the

**Table 2.** Bivariate Associations Between Pain and Financial Hardship.

DV – Presence of Pain or Not	All Men (N = 2883)	
	(1) Unadjusted	(2) Adjusted
<b>IV – Financial Hardship</b>	OR	OR
	[95% CI]	[95% CI]
Total financial hardship	1.28*** [1.15, 1.42]	1.25*** [1.11, 1.40]
Ongoing financial strain	1.33** [1.08, 1.62]	1.25* [1.00, 1.57]
Eat less because of not enough money	2.55*** [1.78, 3.63]	2.27*** [1.51, 3.41]
Take less medication because of cost	2.48*** [1.66, 3.71]	2.14*** [1.46, 3.15]
Difficulty paying bills	1.40** [1.15, 1.71]	1.31* [1.04, 1.63]

Note. Sample counts (N) are unweighted. Estimates are weighted. Models include a constant term.

95% confidential intervals (CI) are in brackets. Odds ratio (OR) is the proportion between the odds of pain in those with and without each financial hardship variable. The adjusted model controls for all sociodemographic factors including age, income-to-needs ratio (INR), education, marital status, and having insurance (Medicare) or not.

Total financial hardship refers to a composite score based on four financial hardship variables.

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

relationship between the presence of pain and four financial hardship indicators as well as total financial hardship without any controls. Findings suggest that men who had one point increase in total financial hardship had a 1.3 (95% CI [1.15, 1.42]) increase in the odds of having pain. Examining each financial hardship individually, we identified that men who experienced food insecurity had a 2.6 (95% CI [1.78, 3.63]) greater odds of experiencing pain. Next, results in the second column of Table 2 indicate the relationship between pain and financial hardship controlling for sociodemographic factors—that is, age, INR, education, marital status, and insurance. Findings suggest that controlling for all other variables, men who had one point increase in total financial hardship had a 1.3 (95% CI [1.11, 1.40]) increase in the odds of having pain; men who experienced food security had a 2.3 (95% CI [1.51, 3.41]) greater odds of experiencing pain; and men who took less medication due to cost had a 2.1 (95% CI [1.46, 3.15]) greater odds of experiencing pain.

### Association Between Pain and Financial Hardship by Race

In Table 3, we present results of logistic regression analysis for the association of the pain presence with a total score of financial hardships and with each individual financial hardship indicator by race, without and with adjusting for age, INR, education, marital status, and insurance. Focusing on results controlling for sociodemographic factors, White men who experienced one or more

financial hardships had a 1.3 (95% CI [1.12, 1.44]) greater odds of experiencing pain. Examining each financial variable individually, we detected a significant association between financial hardship and pain in White men. White men who had ongoing financial strain had a 1.3 (95% CI [1.02, 1.64]) greater odds of experiencing pain. Compared to White men who were not food insecure, those who were had a 2.6 (95% CI [1.51, 4.31]) greater odds of experiencing pain. White men who did take less medication due to cost had a 2.1 (95% CI [1.40, 3.22]) greater odds of experiencing pain compared to White men who took their medication as prescribed. White men who had difficulty paying their bills at a 1.4 (95% CI [1.07, 1.73]) greater odds of experiencing pain compared to other White men who did not have difficulty paying their bills. Among African American men, those who took less medication due to cost had a 3.0 (95% CI [1.31, 6.85]) greater odds of experiencing pain compared to African American men who took their medications as prescribed. All other indicators of financial hardship were not significant among African American men.

### Discussion

Pain and financial hardship are two important factors that impact the quality of life and well-being of older American men. The purpose of this study was to build upon the existing literature on pain and financial hardship among men (Marshall et al., 2018) to examine whether this association differed by race. To our knowledge, this study is one of few to examine pain among

**Table 3.** Unadjusted and Adjusted Regression Analysis of the Association Between Pain and Financial Hardship by Race.

DV – Presence of Pain or Not	Panel A: White Men (N = 2494)		Panel B: African American Men (N = 389)	
	(1) Unadjusted	(2) Adjusted	(1) Unadjusted	(2) Adjusted
<b>IV – Financial Hardship</b>	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Total financial hardship	1.30*** [1.16, 1.45]	1.27*** [1.12, 1.44]	1.15 [0.89, 1.49]	1.09 [0.78, 1.53]
Ongoing financial strain	1.36** [1.10, 1.69]	1.29* [1.02, 1.64]	0.82 [0.41, 1.66]	0.82 [0.41, 1.66]
Eat less because of not enough money	2.90*** [1.80, 4.68]	2.55*** [1.51, 4.31]	1.43 [0.66, 3.08]	1.43 [0.66, 3.08]
Take less medication because of cost	2.48*** [1.62, 3.82]	2.12*** [1.40, 3.22]	2.99* [1.31, 6.85]	2.99* [1.31, 6.85]
Difficulty paying bills	1.45*** [1.18, 1.79]	1.36* [1.07, 1.73]	0.67 [0.33, 1.39]	0.67 [0.33, 1.39]

Note. Sample counts (N) are unweighted. Estimates are weighted. Models include a constant term. 95% confidential intervals (CI) are in brackets. Odds ratio (OR) is the proportion between the odds of pain in those with and without each financial hardship variable. The adjusted model controls for all sociodemographic factors including age, income-to-needs ratio (INR), education, marital status, and having insurance (Medicare) or not. Total financial hardship refers to a composite score based on four financial hardship variables.

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

men stratified by race. We confirmed that among white men, ongoing financial strain, food insecurity, had taken less medication due to cost, and had difficulty paying their bills were associated with the presence of pain. However, among African American men taking less medication due to cost is associated with the presence of pain but none of the other financial hardship indicators. The present study underscores the importance of including financial hardship as an additional SES measure to gaining more understanding regarding the presence of pain among older men. Further, these findings suggest that the presence of pain is related to different types of financial hardship by race.

The findings from this study indicate that the relationship of each of the five financial hardship indicators (ongoing financial strain, food insecurity, taking less medication due to cost, and difficulty paying bills, and total financial hardship as a composite score) with the presence of pain was different among White and Black men with and without financial hardship. For White men, findings suggest a strong association between each financial hardship indicator and the presence of pain; even after controlling for all the covariates. Our findings for White men were consistent with prior research suggesting that greater financial hardship was associated with greater experiences of pain and higher pain severity (Marshall et al., 2018). However, for African American men, there was a strong association between taking less medication due to cost and the presence of pain only.

Although there is a dearth of research examining the direct link between financial hardship and pain, these findings are relevant to the wider literature that addresses the effects of economic circumstances on chronic pain conditions. Existing scholarship suggests that economic hardship serves as a chronic stressor to increase the risk of chronic pain (Rios & Zautra, 2011). For example, greater pain frequency and intensity is associated with

less financial support from private and public welfare provisions (Jablonska et al., 2006).

Other studies on financial hardship and chronic health conditions indicate that individuals with lower SES are more vulnerable to chronic health problems due to fewer economic and psychosocial resources that may help ameliorate the daily stress and frailty from the persistence of stressful life events they face (Almeida et al., 2005; Gallo & Matthews, 2003; Kawachi et al., 2005; Wilkinson, 2016). These findings support previous research indicating that compared to Whites, African Americans who had fewer individual- and neighborhood-level socioeconomic resources experienced higher chronic pain (Green & Hart-Johnson, 2010). The present study's findings may illuminate how daily differences in financial hardships can contribute to racial inequalities in the experience of pain by older men. From a stress process (Pearlin et al., 1981) and cumulative disadvantage (Dannefer, 2003) framework, the effects of financial hardship on men's experiences of pain can be fully captured by assessing the nature and extent of financial hardship as a chronic stressor in the day-to-day stress manifestation processes leading to racial disparities in pain (Byrd et al., 2020; Rios & Zautra, 2011). In this vein, the present study suggests that future research needs to investigate the multiple and complex relations among SES measured by objective (economic) and subjective (psychosocial) resources, stress embodiment, and the perception of pain in understanding the link between financial hardship and pain. Meanwhile, although the present study uses INR and educational attainment as an indicator of SES for statistical control, it may not be adequate for this aging sample (Rios & Zautra, 2011). Further investigation of the role of other SES-related variables in making differences in the experience of pain among various racial and ethnic groups, such as household wealth (Janevic et al., 2017) or health-care resources such as density

and diversity of health-care providers in the community (Cook et al., 2013), would be useful.

### *Implications*

Among White men, financial hardship as measured by all indicators, is associated with the presence of pain. For African American men, these findings suggest that taking less medication due to cost is strongly associated with the presence of pain. One potential explanation may be that if older African American men are on a fixed income, or are living paycheck to paycheck, they may be forced to choose between purchasing or not purchasing basic necessities (i.e., buying food, paying utilities, rent) or buying or forgoing their medications. A second possible explanation is that perhaps older African American men, similar to other racial groups, share the belief that there is no harm to their health if they cut their pills in half, take their pills every other day, or “supplement” their medications with complementary and alternative medicine (CAM), resulting in taking less medications due to cost. Although doing so will prolong the use of their medications and allow them to redirect money to other needed expenses, it is harmful to their health and well-being. A third possibility is that African American men may have inadequate financial resources to fill their prescriptions (Szanton et al., 2010; Powell et al., 2019). On average, the total annual cost of prescribed pain medications was estimated as \$17.8 billion in the United States, and the three main costly categories for pain treatment were adjuvants (\$12.3 billion), opioids (\$3.6 billion), and analgesics/nonsteroidal anti-inflammatory drugs (\$1.9 billion) (Rasu et al., 2014). In conjunction with the increased burden of receiving effective pain therapy, African American men tend to use less medications due to medical mistrust associated with racial bias, low income, and a lack of health insurance (Abramson et al., 2015; Hostetter & Klein, 2021; Idan et al., 2020; Noonan et al., 2016; Powell et al., 2019). The challenge with the above three plausible explanations is that by not taking medications when prescribed can be dangerous and complicate their health conditions even further.

These findings have potential policy and practice implications. Because the relationship between older men's behaviors such as taking less medication due to cost and the experience of pain can be mutually reinforced (Marshall et al., 2018), developing policy directives to address significant barriers to adequate pain care as well as practice strategies to understand a variety of dimensions based on patients' different needs may be key to reducing the impact of pain and the resultant suffering among men aged 50 and over, especially among minority men (Institute of Medicine, 2011). In addition, stressful life events such as the current pandemic resulting

in economic and employment insecurities may further exacerbate the already poor health outcomes experienced by men. More research is needed to thoroughly understand the persistence of the detrimental impact of financial hardships on chronic pain and other relevant health outcomes, in an effort to improve the pain management system for men 50 years and older in the United States.

### *Strengths and Limitations*

The present study provides three main contributions to the literature on pain in the United States. The first key contribution of this study is that it empirically examines men's experience of pain by race, which has been overlooked in previous research. Second, this study assesses social influences indicated by four forms of financial hardship as an indicator of the perception of pain. This line of inquiry has received minimal attention (Marshall et al., 2018). Third, this study conducts analyses using a large population-based representative sample, providing insights that may be helpful with the development of future interventions for older American men with pain as an intersecting consequence of race and lower SES.

Although this study contributes to the understanding of pain and financial hardship among men by race, it is not without limitations. First, our study relies on cross-sectional data, which do not allow for testing of the causal processes between financial hardship and pain in this study. Future research based on longitudinal samples that include men and their changing experiences of financial hardship and pain may advance the understanding of how financial hardship shapes the presence of pain and/or pain severity through the life course for healthy aging. Second, more refined measures of financial hardship and pain may develop more detailed and nuanced understanding of the associations between financial hardship and pain. Third, due to lack of information in the HRS, our study is unable to control type of medication (i.e., pain vs. non-pain prescription drugs) as it relates to the question on taking less prescribed medication due to cost, which may be the most relevant for the African American men. Future research may benefit from the differentiation of type of medication if that information is available in the HRS. Fourth, social and cultural norms regarding pain perception and reporting may affect older African American men's ability and opportunity to take appropriate pain medications; however, this was not explored in depth in the present study. For example, research suggests that cultural gender norms (e.g., emphasis on machismo and stoicism) and types of social relationships provided by family, friends, and significant others have an impact on African American men's health-seeking behaviors (Eley et al., 2019). Future research would benefit from examining the nature and degree of social and cultural influences on African



American men's health-seeking behaviors to fully capture social determinants of pain. Finally, the potential mediating role of the perception of financial hardship between de facto financial hardship and the perception of pain (i.e., financial hardship leads to toughness, resulting in feeling less pain vs. financial hardship leads to weakness, resulting in feeling more pain) by race (Hoffman & Trawalter, 2016) may factor into future analysis, thereby contributing to the understanding of how racial bias in perception of financial hardship shapes differences in pain perception and pain report.

In conclusion, the present study is one of few studies to explore this topic, and it contributes to our understanding of the relationship between financial hardship and pain among older men by race. Financial hardship is critical to older White men's pain, and our findings suggest that racial differences in the presence of pain are associated with different types of financial hardship. Our study thus provides the foundation for future research to consider the intricate intersections of age, gender, race, and SES in promoting health related to pain among older men in the United States.

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### Ethics Approval and Informed Consent Statement

This is a secondary data analysis using publicly available data from the Health and Retirement Study (HRS). Collection and production of HRS data comply with the requirements of the University of Michigan's Institutional Review Board (IRB).

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