

More Problems, More Pain: The Role of Chronic Life Stressors and Racial/Ethnic Identity on Chronic Pain Among Middle-Aged and Older Adults in the United States

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Abstract

There is a high prevalence of chronic pain among middle-aged and older adults in the United States. Chronic life stressors have been shown to have detrimental consequences for myriad health conditions, including chronic pain. However, there is limited evidence on the types of chronic life stressors that affect middle-aged and older adults and how these stressors influence the chronic pain burden in this population. Moreover, the interaction between chronic life stressors and racial/ethnic identity remains poorly understood as it relates to chronic pain. The current analysis used the 2018 Health and Retirement Study to investigate relationships between chronic life stressors and odds to experience any chronic pain and high-impact chronic pain. Chronic life stressors were characterized, overall and by racial/ethnic identity, and the main and interaction effects were calculated to evaluate relationships between chronic life stressors, racial/ethnic identity, and odds of experiencing any chronic pain and high-impact chronic pain. Results indicate that in 2018, the most common chronic life stressor among middle-aged and older adults was dealing with their own health problems (68%), followed by dealing with the physical or emotional issues affecting a spouse or child (46%). Adjusted analyses showed that a higher total of chronic life stressors increased the odds of middle-aged and older adults experiencing any chronic pain and high-impact chronic pain. There were no significant interactions between the overall chronic life stress burden and racial/ethnic identity as a predictor of odds to experience any chronic pain or high-impact chronic pain, but significant interaction effects were found related to specific chronic life stressors. Findings underscore the significant impact of chronic life stressors on the chronic pain burden among middle-aged and older adults in the United States, which cut across racial/ethnic identity.

Keywords

Chronic stressors, chronic pain, high-impact chronic pain, middle-aged and older adults, health and retirement study

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Introduction

Chronic pain affects one in five adults in the United States (U.S.), making it a public health priority nationally.^{1,2} Chronic pain disproportionately affects middle-aged and older adults, who are also more likely to experience high-impact chronic pain—or chronic pain that limits functional activities and social participation.^{2,3} Moreover, among older adults specifically, chronic pain has been linked to higher levels of disability, worse quality of life, accelerated cognitive decline, and premature death.^{4–7} A better understanding of the mutable factors which can prevent or reduce the negative sequelae of chronic pain among aging adults is needed, particularly given the projected growth of the older adult population in the coming years.

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Pain is defined as a personal experience that is influenced by a multitude of factors.⁸ The biopsychosocial model of pain is a widely accepted framework to explain pain by emphasizing biological, psychological, and social contributions to the pain experience.⁹ Yet, social determinants of pain remain understudied in the field, despite evidence that social and environmental factors account for as much as 70% of health outcomes.^{10,11} Research on life stressors is one such area that has been largely unexplored, particularly in the area of chronic pain among middle-aged and older adults. Stressors can be considered adverse life circumstances that can impair one's health and quality of life.¹² Exposure to adverse life circumstances, particularly when experienced chronically, can lead to stress and, in response, detrimental biological and psychological processes.¹²⁻¹⁴ Chronic stress is thought to alter the body's physiological response through mechanisms such as higher allostatic load and concentration of inflammatory cytokines, which could contribute to the development and severity of chronic pain.^{15,16}

The specific influence of stress on racial/ethnic differences in pain outcomes is another area of emerging research. There is evidence that adults from racial and ethnic minoritized groups experience a higher burden of chronic life stressors, and report more severe pain and pain-related disability.¹⁷⁻¹⁹ Data in the U.S. on racial/ethnic differences in exposure to life stressors have shown that Hispanic and non-Hispanic Black adults are more likely to have family incomes below the federal poverty level, to live in crowded housing, and to have more informal caregiving responsibilities.^{20,21} In addition, Hispanic and non-Hispanic Black adults are disproportionately affected by several chronic health conditions, such as diabetes.²² Non-Hispanic Black adults are more likely to experience two or more chronic health conditions compared to non-Hispanic White adults as well.²³

While there is evidence of racial/ethnic differences in the types and accumulation of chronic life stressors, limited research has focused specifically on the chronic life stressors that middle-aged and older adults experience, as well as potential relationships between chronic stressors and the chronic pain burden experienced by this population. It is possible that non-Hispanic Black and Hispanic middle-aged and older adults experience more pain due to a higher burden of chronic life stressors, or that the relationship between chronic stressors and chronic pain may differ across racial/ethnic identities. However, these relationships have been unexplored. To address these gaps, the current cross-sectional study used nationally-representative data of middle-aged and older adults (aged 51 years and older) in the U.S. to address two specific aims: (a) to characterize the chronic life stressors affecting middle-aged and older adults, overall, and across three racial/ethnic identities (Hispanic, non-Hispanic Black, non-Hispanic White); and (b) to investigate associations between chronic life stressors and odds of experiencing any chronic pain and high-impact chronic pain, including interactions between chronic life stressors and racial/ethnic identity. We hypothesized that Hispanic and non-Hispanic Black middle-aged and older adults would have

a higher proportion of chronic life stressors relative to non-Hispanic White middle-aged and older adults. In addition, we hypothesized that a higher total number of chronic life stressors would increase the odds of any chronic pain and high-impact chronic pain among all middle-aged and older adults, regardless of racial/ethnic identity. Finally, we expected there to be some differential effects of specific chronic life stressors on the odds of chronic pain across racial/ethnic identities. However, we were less clear on where we would observe these interaction effects due to the limited evidence available in this area.

Materials and Methods

Data

Data from the 2018 Health and Retirement Study (HRS) were used for the current study. The HRS is an ongoing, biennial, longitudinal panel study on health and aging among a representative sample of more than 20 000 noninstitutionalized adults 51 years of age and older in the U.S.²⁴ The HRS is sponsored by the National Institute on Aging (grant number U01AG009740) and Social Security Administration. It is conducted by the University of Michigan's Institute for Social Research and study procedures have been approved by the University of Michigan Institutional Review Board. The first cohort was interviewed in 1992 and biennially thereafter. HRS oversamples Hispanic and non-Hispanic Black middle-aged and older adults and study participants are asked about physical and mental health, cognitive functioning, health care usage and coverage, employment, and financial information. The full details of the HRS, including information on the study sample and data collection procedures, are described elsewhere.²⁵

HRS data have been used extensively to characterize how psychosocial factors influence the health status and trajectories of middle-aged and older adults in the U.S. Beginning in 2006, a rotating subgroup of half of HRS respondents were selected at random to complete an enhanced face-to-face survey (EFTF), including a leave-behind questionnaire which focuses on the collection of psychosocial data.²⁶ The current study includes the random subsample of respondents who completed the leave-behind questionnaire in 2018 to analyze relationships between exposure to chronic life stressors and experiences of any and high-impact chronic pain, as well as interactions between chronic life stressors and racial/ethnic identity on these relationships. For 2018, there was a random subsample of 8806 respondents who were eligible for the leave-behind questionnaire of which 5695 were completed and returned by mail. We analyzed data from all Hispanic, non-Hispanic Black, and non-Hispanic White respondents who completed and returned the leave-behind questionnaire ($n = 5314$).

Outcome Variables

Any Chronic Pain and High-Impact Chronic Pain. There is not currently a consistent definition of chronic pain across population-

based studies.²⁷ The HRS captures self-reported pain using multiple questions. The survey first asks this question of all respondents: “Are you often troubled with pain?.” For the current study, respondents who answered “Yes” to this question were coded as having any chronic pain, an approach that has previously been used to estimate chronic pain prevalence among HRS participants.²⁸ In addition, for respondents who answered “Yes” to this initial question, a follow-up question was asked with respect to pain impact. Respondents are asked, “Does the pain make it difficult for you to do your usual activities such as household chores or work?.” Respondents who answered “Yes” to this question were coded as having high-impact chronic pain.

Independent Variable

Chronic Life Stressors. Chronic life stressors were operationalized in the HRS as events that were “current and ongoing problems that had lasted 12 months or longer.” Examples of ongoing problems were those related to the participant’s health or the health of a close relative, as well as problems related to their work or financial situation.²⁹ A total of eight items were rated on a 4-point scale ranging from 1, “no, not a problem” to 4, “yes, very upsetting.” Each item was transformed into a binary variable (yes/no) indicating whether they had the problem. While prior studies have focused only on problems that were noted as being severe (i.e., very upsetting), the present study was interested in the presence or absence of a problem versus the appraisal of the severity of a problem.^{29,30} We then summed the eight items to account for the total number of chronic life stressors identified (range = 0-8), with higher totals signifying a higher chronic life stressor burden.

Demographic Variables

We accounted for four self-reported demographic variables in the present study. Racial/ethnic identity was categorized based on self-identification into three groups: Hispanic, non-Hispanic Black, and non-Hispanic White. Given their salience to pain, we also included age, sex, and self-reported general health as covariates. We categorized age into four groups: 51 to 59, 60 to 69, 70 to 79, and 80 years or older. Sex was dichotomized as either female or male. Self-reported general health was divided into three categories: very good to excellent, good, and fair to poor.

Analytic Approach

Descriptive statistics were calculated for each chronic life stressor and the chronic life stressor burden among the total sample and across each racial/ethnic identity. One-way analysis of variance (ANOVA) and Chi-squared (χ^2) tests were used to determine if there were racial/ethnic differences. We calculated the main effects for chronic stressor burden and each type of chronic stressor to determine the odds of experiencing any chronic pain and high-impact chronic

using logistic regression, adjusting for age, sex, racial/ethnic identity, and self-rated general health. For these models, we present the adjusted odds ratios (aOR) and 95% confidence intervals, with an aOR higher than 1.0 indicating a greater odds of experiencing chronic pain versus an aOR less than 1.0 indicating a lower odds of experiencing chronic pain. Finally, we investigated potential interactions between racial/ethnic identity and chronic life stressors on each of the chronic pain outcomes. We then estimated the average marginal effects using post estimation commands for any model that showed significant interaction effects. Marginal effects allow for the examination of whether the exposure has the same or differential effects on the probability of an outcome for the groups of interest.³¹ Statistical significance was considered at $p < .05$. Stata 17.0 was used to complete all analytic procedures.

Results

Shown in Table 1, a higher proportion of participants identified as non-Hispanic White (67.9%), and were between 51 and 70 years old (65.8%), female (53.5%), and rated their health as excellent or very good (43.4%). The prevalence of chronic pain and high-impact chronic pain were 40.0% and 25.5%, respectively. There were differences in participant characteristics between racial/ethnic identity groups. A higher proportion of the non-Hispanic White subgroup was over the age of 70 years old and rated their health as excellent to very good relative to Hispanic and non-Hispanic Black participants. In addition, there was a significantly higher prevalence of high-impact chronic pain among Hispanic (32.0%) and non-Hispanic Black participants (31.0%) compared to non-Hispanic White participants (23.8%).

Shown in Table 2, the overall sample had an average of 2.73 chronic life stressors. The most common chronic life stressors were participants’ own ongoing health problems (70.16%), followed by physical or emotional problems in a spouse or child (46.22%), and financial strain (41.50%). Non-Hispanic Black middle-aged and older adults had a significantly higher chronic life stressor burden (3.19 ± 2.22), overall, relative to Hispanic middle-aged and older adults (2.86 ± 2.14), and both were significantly higher than the chronic life stressor burden among non-Hispanic White middle-aged and older adults (2.58 ± 1.82). While racial/ethnic differences were also evident across several specific types of chronic life stressors, there were no differences in the proportion of middle-aged and older adults who experienced the two most common chronic life stressors, namely ongoing problems related to their own health or that of a spouse or child.

Shown in Figures 1 and 2, a higher chronic life stressor burden predicted an increased odds for experiencing any chronic pain and high-impact chronic pain. For middle-aged and older adults with four or more chronic life stressors, there

Table 1. Participant Characteristics, Overall and Stratified by Racial/ethnic Identity (Unweighted Sample: $n = 5314$).

	Overall ($n = 5314$) N Weighted % (95% CI)	HSP ($n = 715$) N Weighted % (95% CI)	NHB ($n = 992$) N Weighted % (95% CI)	NHW ($n = 3607$) N Weighted % (95% CI)	P-Value*
Age (years)					
51-59	1215 29.2 (.27, .32)	230 42.4 (.35, .50)	297 37.5 (.32, .43)	688 26.2 (.23, .30)	<.001
60-69	1818 36.6 (.34, .39)	305 33.8 (.27, .41)	399 33.7 (.29, .38)	1114 37.5 (.34, .41)	
70-79	1321 22.1 (.20, .24)	119 16.9 (.13, .22)	193 19.4 (.16, .24)	1009 23.2 (.21, .25)	
80-89	960 12.0 (.11, .13)	61 7.0 (.05)	103 9.4 (.07, .12)	796 13.1 (.12, .15)	
Sex					
	3163 53.5 (.52, .55)	427 53.1 (.49, .58)	638 58.3 (.54, .62)	2098 52.9 (.51, .55)	.078
Female	2151 46.5 (.45, .48)	288 46.9 (.42, .51)	354 41.7 (.38, .46)	1509 47.1 (.46, .49)	
Male					
Self-rated health					
	2064 43.4 (.41, .45)	159 23.7 (.19, .29)	261 28.2 (.24, .33)	1644 48.3 (.46, .50)	<.001
Excellent or very good	1865 32.3 (.30, .34)	247 30.6 (.26, .36)	412 37.2 (.33, .42)	1206 31.8 (.30, .34)	
Good	1404 24.3 (.22, .26)	309 45.7 (.38, .54)	318 34.5 (.30, .39)	756 19.9 (.18, .22)	
Fair or poor	Missing 2	0	1	1	
Any chronic pain					
	3125 60.0 (.58, .62)	412 55.3 (.50, .61)	562 56.1 (.51, .61)	2151 61.2 (.59, .63)	.049
No	2185 40.0 (.38, .42)	301 44.7 (.39, .50)	430 43.9 (.39, .49)	1454 38.8 (.37, .41)	
Yes	Missing 4	2	0	2	
Missing					
High-impact chronic pain					
	3944 74.5 (.73, .76)	510 68.0 (.60, .75)	709 69.0 (.64, .74)	2725 76.2 (.74, .78)	.008
No	1366 25.5 (0.24, 0.27)	203 32.0 (0.25, 0.40)	283 31.0 (.26, .36)	880 23.8 (.22, .26)	
Yes	Missing 4	2	0	2	
Missing					

Notes: * p -value based on differences between racial/ethnic identity groups for the weighted sample; CI confidence interval; HSP, NHB, and NHW stand for Hispanic, non-Hispanic Black, and non-Hispanic White, respectively.

Table 2. Summary of Chronic Life Stressors Among Middle-Aged and Older Adults, Overall and Stratified by Racial/ethnic Identity.

	All	HSP	NHB	NHW	P-Value
Chronic life stressor burden, mean (SD)	2.73 (1.95)	2.86 (2.14)	3.19 (2.22)	2.58 (1.82)	<.001
Chronic life stressor burden, n (%)					<.001
0-1	1505 (30.73)	207 (31.46)	234 (26.03)	1064 (31.85)	
2-3	1879 (38.36)	236 (35.87)	298 (33.15)	1345 (40.26)	
≥4	1514 (30.91)	215 (32.67)	367 (40.82)	932 (27.90)	
Health problems (self), n (%)					.472
Yes	3711 (70.16)	500 (68.31)	683 (70.05)	2528 (70.58)	
No	1578 (29.84)	232 (31.69)	292 (29.95)	1054 (29.42)	
Physical or emotional problems (spouse or child), n (%)					.155
Yes	2418 (46.22)	345 (47.46)	419 (43.46)	1654 (46.71)	
No	2814 (53.78)	382 (52.54)	545 (56.54)	1887 (53.29)	
Financial strain, n (%)					<.001
Yes	2183 (41.50)	340 (47.29)	539 (55.80)	1304 (36.48)	
No	3077 (58.50)	379 (52.71)	427 (44.20)	2271 (63.52)	
Helping at least one sick, limited, or frail family member or friend, n (%)	1869 (35.51)	269 (37.15)	411 (42.46)	1189 (33.29)	<.001
Yes					
No	3395 (64.49)	455 (62.85)	557 (57.54)	2383 (66.71)	
Problems in close relationship, n (%)					<.001
Yes	1367 (25.98)	195 (26.97)	316 (32.68)	856 (23.97)	
No	3894 (74.02)	528 (73.03)	651 (67.32)	2715 (76.03)	
Housing problems, n (%)					<.001
Yes	1047 (19.93)	174 (24.07)	328 (33.95)	545 (15.29)	
No	4206 (80.07)	549 (75.93)	638 (66.05)	3019 (84.71)	
Alcohol or drug use problems (family), n (%)					.006
Yes	1020 (19.34)	131 (18.02)	223 (22.94)	666 (18.62)	
No	4255 (80.66)	596 (81.98)	749 (77.06)	2910 (81.38)	
Difficulties at work, n (%)					<.001
Yes	945 (18.58)	159 (22.62)	208 (21.94)	578 (16.82)	
No	4142 (81.42)	544 (77.38)	740 (78.06)	2858 (83.18)	

Notes: Unadjusted prevalence estimates for unweighted sample. HSP, NHB, and NHW stand for Hispanic, non-Hispanic Black, and non-Hispanic White, respectively.

was a two-fold increase in the odds of experiencing any chronic pain (aOR = 2.23; $p < .001$), and a nearly three-fold increase in the odds of experiencing high-impact chronic pain (aOR = 2.72; $p < .001$). In addition, respondents who were experiencing their own health problems predicted a three-fold and four-fold increase in the odds of experiencing any chronic pain (aOR = 3.05; $p < .001$) and high-impact chronic pain (aOR = 4.26; $p < .001$), respectively. In contrast, ongoing difficulties at work had no significant influence on the odds of experiencing either type of chronic pain. See Supplementary Table S1 for additional details on the aOR for each specific chronic life stressor.

Interaction effects were assessed between chronic life stressor burden and racial/ethnic identity, as well as for each specific chronic life stressor and racial/ethnic identity, on the odds of experiencing chronic pain and high-impact chronic pain. We found no modifying effects of racial/ethnic identity on relationships between the overall chronic life stressor burden and odds of experiencing any chronic

pain or high-impact chronic pain. With respect to specific chronic life stressors, the only significant interaction effect observed was between racial/ethnic identity and ongoing housing problems on the odds of experiencing chronic pain. To illustrate this interaction effect, Figure 3 shows how experiencing ongoing housing problems had a significantly greater effect on non-Hispanic White middle-aged and older adults' likelihood to experience any chronic pain compared to Hispanic and non-Hispanic Black middle-aged and older adults.

Tables 3 and 4 show the adjusted odds of experiencing any chronic pain and high-impact pain stratified by racial/ethnic identity. Having four or more chronic life stressors and dealing with their own health problems continued to be among the strongest predictors of odds to experience chronic pain and high-impact chronic pain across all racial/ethnic identities. Among Hispanic middle-aged and older adults, having four or more chronic life stressors increased the odds of experiencing any chronic pain by nearly three-

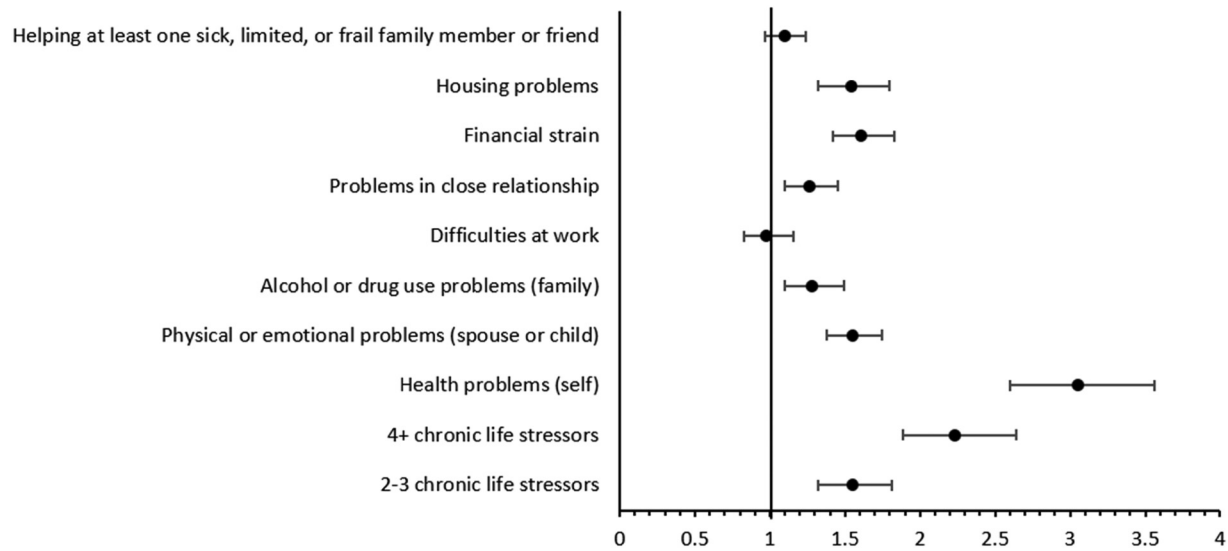


Figure 1. Adjusted odds ratio (aOR) for influence of chronic life stressors on chronic pain.
Notes: Model estimates are based on the unweighted sample; models adjusted for age, sex, and self-rated health.

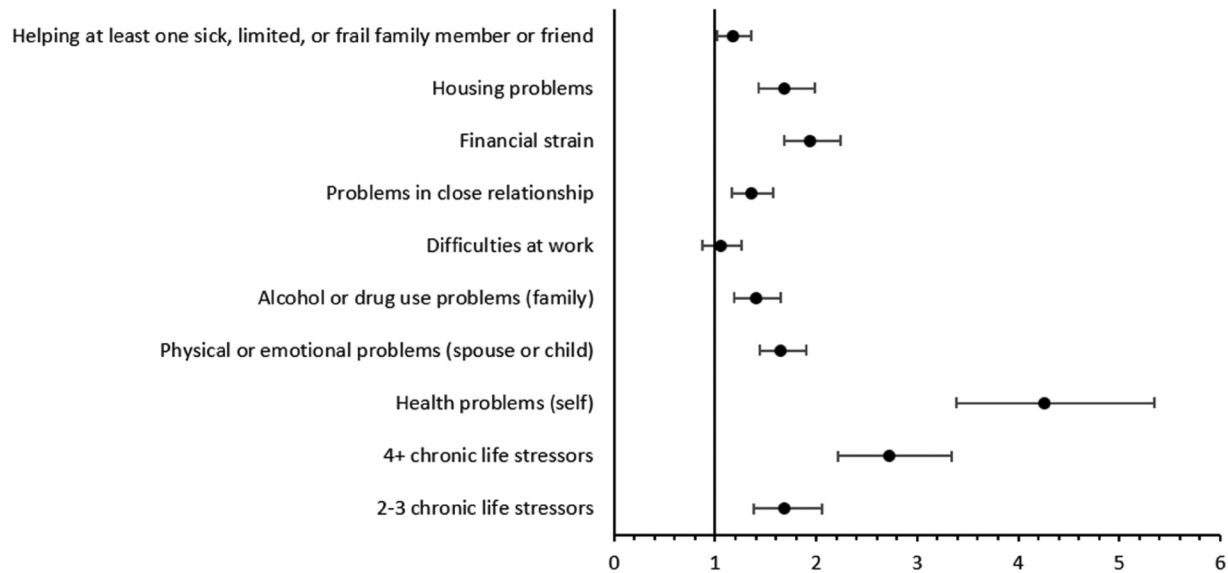


Figure 2. Adjusted odds ratio (aOR) for influence of chronic life stressors on high-impact chronic pain.
Notes: Model estimates are based on the unweighted sample; models adjusted for age, sex, and self-rated health.

fold (aOR = 2.63; $p < .001$) and high-impact chronic pain by four-fold (aOR = 4.17; $p < .001$). Among non-Hispanic Black middle-aged and older adults, it increased the odds of any chronic pain by two-fold (aOR = 2.11; $p < .001$) and high-impact chronic pain by nearly three-fold (aOR = 2.88; $p < .001$). Similarly, among non-Hispanic White middle-aged and older adults, having four or more chronic life stressors increased the odds of experiencing any chronic pain by two-fold (aOR = 2.27; $p < .001$) and nearly three-fold for high-impact chronic pain (aOR = 2.55; $p < .001$).

Discussion

The current study characterized the chronic life stressors affecting older middle-aged and older adults in the U.S. and examined relationships between these stressors and chronic pain using data from the 2018 Health and Retirement Study. Study results indicate that health concerns affecting themselves and their families are the most prevalent chronic life stressors. In addition, having a higher burden of chronic life stressors increased the odds of experiencing chronic pain and high-impact chronic pain in this population.

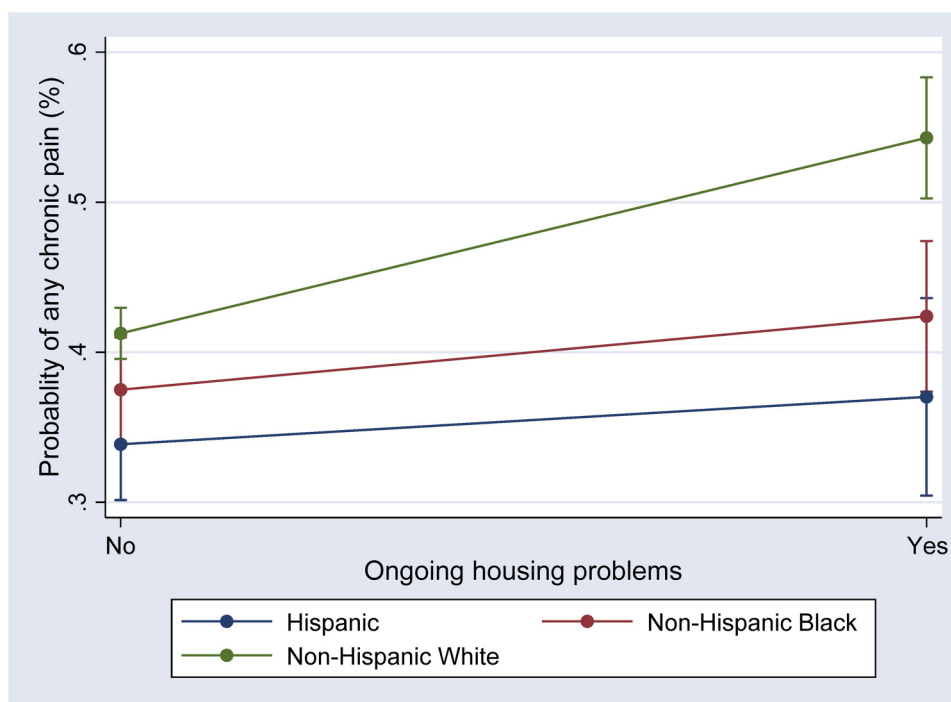


Figure 3. Average marginal effects of ongoing housing problems on the probability of any chronic pain, by racial/ethnic identity with 95% confidence intervals.

Notes: Model estimates are based on the unweighted sample; model adjusted for age, sex, and self-rated health.

Table 3. Adjusted Odds Ratio (aOR) for the Influence of Chronic Life Stressors on the Odds of Experiencing any Chronic Pain, by Racial/Ethnic Identity.

	Hispanic		Non-Hispanic Black		Non-Hispanic White	
	aOR (95% CI)	P-Value	aOR	P-Value	aOR	P-Value
Chronic stressors						
0-1	Reference	—	Reference	—	Reference	—
2-3	1.63 (1.04, 2.57)	.034	1.98 (1.34, 2.94)	.001	1.45 (1.20, 1.75)	<.001
≥4	2.63 (1.65, 4.19)	<.001	2.11 (1.43, 3.10)	<.001	2.27 (1.85, 2.80)	<.001
Health problems (self)	2.82 (1.89, 4.22)	<.001	3.40 (2.38, 4.84)	<.001	3.06 (2.52, 3.72)	<.001
Physical or emotional problems (spouse or child)	2.03 (1.45, 2.83)	<.001	1.60 (1.21, 2.12)	.001	1.47 (1.26, 1.70)	<.001
Alcohol or drug use problems (family)	1.37 (0.90, 2.07)	.139	1.12 (0.81, 1.55)	.480	1.32 (1.10, 1.60)	.003
Difficulties at work	0.86 (0.57, 1.30)	.464	0.89 (0.63, 1.26)	.509	1.05 (0.85, 1.30)	.623
Problems in close relationship	1.38 (0.95, 2.00)	.088	1.46 (1.09, 1.95)	.012	1.19 (1.00, 1.41)	.048
Financial strain	1.75 (1.24, 2.46)	.001	1.61 (1.22, 2.14)	.001	1.59 (1.36, 1.86)	<.001
Housing problems	1.22 (0.83, 1.77)	.312	1.28 (0.96, 1.71)	.092	1.82 (1.48, 2.23)	<.001
Helping at least one sick, limited, or frail family member or friend	1.08 (0.77, 1.51)	.658	1.14 (0.86, 1.50)	.361	1.09 (0.94, 1.28)	.255

Note: Model estimates are based on the unweighted sample; each model adjusted for age, sex, and self-rated health.

While Hispanic and non-Hispanic Black middle-aged and older adults experienced more chronic life stressors, the negative consequences of having a higher chronic life stressor burden were shared across racial/ethnic identities. Study findings lend support to the growing body of literature which underscores the detrimental effects of chronic stress on health outcomes, including in the area of pain.

Consistent with our hypothesis, a key study finding was that a higher burden of chronic life stressors did increase the odds for middle-aged and older adults to experience chronic pain and high-impact chronic pain. These relationships were consistent across racial/ethnic groups. Our findings are in alignment with prior studies linking an excess of psychosocial stressors to poorer pain outcomes.³² In

Table 4. Adjusted Odds Ratio (aOR) for the Influence of Chronic Life Stressors on the Odds of Experiencing High-Impact Chronic Pain, by Racial/ethnic Identity.

	Hispanic		Non-Hispanic Black		Non-Hispanic White	
	aOR (95% CI)	P-Value	aOR	P-Value	aOR	P-Value
Chronic stressors						
0-1	Reference	—	Reference	—	Reference	—
2-3	1.99 (1.15, 3.46)	.014	2.14 (1.29, 3.53)	.003	1.57 (1.23, 1.99)	<.001
≥4	4.17 (2.41, 7.21)	<.001	2.88 (1.78, 4.67)	<.001	2.55 (1.98, 3.28)	<.001
Health problems (self)	3.98 (2.34, 6.77)	<.001	4.19 (2.59, 6.79)	<.001	4.41 (3.27, 5.95)	<.001
Physical or emotional problems (spouse or child)	2.09 (1.44, 3.02)	<.001	1.73 (1.27, 2.35)	.001	1.57 (1.32, 1.86)	<.001
Alcohol or drug use problems (family)	1.44 (0.92, 2.24)	.107	1.48 (1.05, 2.09)	.027	1.38 (1.12, 1.70)	.003
Difficulties at work	1.06 (0.67, 1.67)	.813	0.92 (0.63, 1.35)	.672	1.13 (0.88, 1.44)	.337
Problems in close relationship	1.45 (0.97, 2.16)	.068	1.67 (1.21, 2.31)	.002	1.25 (1.02, 1.52)	.030
Financial strain	3.10 (2.10, 4.59)	<.001	1.76 (1.27, 2.44)	.001	1.82 (1.52, 2.18)	<.001
Housing problems	1.75 (1.17, 2.62)	.006	1.52 (1.11, 2.08)	.009	1.74 (1.40, 2.17)	<.001
Helping at least one sick, limited, or frail family member or friend	1.48 (1.02, 2.14)	.038	1.28 (0.94, 1.74)	.122	1.09 (0.91, 1.30)	.359

Note: Model estimates are based on the unweighted sample; each model adjusted for age, sex, and self-reported general health.

addition, while Hispanic and non-Hispanic Black middle-aged and older adults had a significantly higher burden of chronic life stressors, compared to non-Hispanic White middle-aged and older adults, the negative effects of exposure to chronic life stressors does not appear to be racially or ethnically distinct. Instead, study findings suggest that an accumulation of chronic life stressors are detrimental to middle-aged and older adults' chronic pain experiences, regardless of racial/ethnic identity, and the inequity exists upstream in the disproportionate exposure to these stressors among middle-aged and older adults in racial and ethnic minoritized groups. Thus, establishing policies and practices that can reduce the burden of chronic life stressors affecting racial and ethnic minoritized groups is necessary to promote health equity in this population. For clinicians, discussing the types of chronic life stressors that middle-aged and older adults are experiencing and their potential impact on their pain is recommended. Further, providing relevant resources and support to facilitate middle-aged and older adults' capacity to cope with the life stressors affecting them is suggested.

Notably, there was one significant interaction effect between chronic life stressors and racial/ethnic identity on the odds to experience any chronic pain. Experiencing ongoing housing problems had a greater influence on non-Hispanic White middle-aged and older adults' likelihood to experience any chronic pain compared to Hispanic and non-Hispanic Black middle-aged and older adults. The explanation behind this finding is unclear. The relationship between housing and chronic pain is an understudied area. Bhat et al (2022) found that experiencing housing insecurity, or a person's increased vulnerability to disruptions in their current housing situation, was associated with poorer self-

rated health and a higher number of chronic conditions among middle-aged and older adults.³³ These findings are consistent with our finding that, overall, ongoing housing problems predicted a greater odds of experiencing any chronic pain and high-impact chronic pain. However, Bhat et al (2022) also found a significant and positive relationship among increasing housing insecurity and number of chronic health conditions among non-Hispanic Black adults, but not non-Hispanic White adults, which runs counter to our results.³³ The authors suggest that the racial differences identified in their study may be related to greater access to wealth among non-Hispanic White adults, which could buffer the negative effects of housing insecurity on health outcomes.³³ These conflicting findings are likely explained by differences in how housing problems were conceptualized and the health outcome of interest across the studies. In the current study, the HRS asked about "ongoing housing problems" which could be interpreted in multiple ways by participants, such as concerns regarding housing displacement or housing situations that are no longer suitable based on advanced age or mobility impairments. The Bhat et al (2022) study measured housing insecurity using six questions, which asked about specific circumstances, such as being concerned about foreclosure or eviction.³³ Taken together, there is a need for additional research that more robustly examines the influence of housing issues on the chronic pain burden among middle-aged and older adults, and how these relationships may differ across racial/ethnic identities.

The present study does have some limitations. Because this analysis was cross-sectional, the directionality of relationships between chronic life stressors and chronic pain are unable to be ascertained. It is possible that middle-aged and older adults with chronic pain are more likely to experience chronic life stressors.¹⁹ In addition, while in alignment

with some prior work,²⁸ the way we defined chronic pain in the current study is different than how it is defined in many other studies, which can limit opportunities for comparison.²⁷ Moreover, the measure used for chronic life stressors has had limited use in prior research on middle-aged and older adults,³⁴ so its validity in accurately conceptualizing chronic life stressors is less clear, particularly as it relates to chronic pain. Notwithstanding these limitations, this study provides novel information on how stressful life circumstances influence the pain status of middle-aged and older adults. Future investigations on how these life stressors influence pain and functional trajectories over time are needed.

Conclusion

The current study's findings provide evidence of the types of chronic life stressors affecting middle-aged and older adults. Chronic life stressors were disproportionately experienced by middle-aged and older adults from racial and ethnic minoritized groups, yet the detrimental effects of these stressors on the chronic pain burden of this population cut across racial/ethnic identities. Chronic life stressors related to middle-aged and older adults dealing with their own health problems and the physical and emotional issues affecting their spouse or child were most prevalent. Experiencing four or more chronic life stressors increased the odds of experiencing any chronic pain by two-fold and high-impact pain by nearly three-fold. Strategies to reduce the burden of chronic life stressors appear warranted to mitigate the disproportionate burden of chronic pain among middle-aged and older adults.

Author Contributions

ALS and RBF designed the study. ALS analyzed the data and drafted the manuscript. ALS, KAQ, IY, JAG, YCA, and RBP contributed to the interpretation of study findings. ALS, KAQ, IY, JAG, YCA, and RBF critically revised the manuscript for intellectual content. ALS, KAQ, IY, JAG, YCA, and RBF approved the final manuscript.

Availability of Data and Materials

Data for the 2018 Health and Retirement Study core public survey data is available here: https://hrsdata.isr.umich.edu/data-products/public-survey-data?_ga=2.8288378.953035295.1674504685-1731101969.1674504685.

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Supplemental Material

Supplemental material for this article is available online.

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