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Prevalence and Sociodemographic Correlates of Chronic Pain Among A Nationally Representative Sample of Older Adults in the United States

Lisa R. LaRowe, PhD[a,b], **Christine Miaskowski, RN, PhD**[c], **Angela Miller, MA**[a], **Andrea Mayfield, MPH**[d], **Francis J. Keefe, PhD**[e], **Alexander K. Smith, MD, MS, MPH**[f,g], **Bruce A. Cooper, PhD**[c], **Lee-Jen Wei, PhD**[h], **Christine S. Ritchie, MD, MSPH**[a,b]

[a]Mongan Institute Center for Aging and Serious Illness, Massachusetts General Hospital

[b]Department of Medicine, Harvard Medical School

[c]School of Nursing, University of California, San Francisco

[d]NORC at the University of Chicago

[e]Department of Psychiatry & Behavioral Sciences, Duke University School of Medicine

[f]Division of Geriatrics, University of California, San Francisco

[g]San Francisco VA Medical Center

[h]Harvard T.H. Chan School of Public Health

Abstract

Subgroup analyses conducted among U.S. national survey data have estimated that 27-34% of adults aged ≥65 years have chronic pain. However, none of these studies focused specifically on older adults or examined disparities in chronic pain in those aged ≥65 years. To obtain current information on the prevalence and sociodemographic correlates of chronic pain in U.S. older adults, a cross-sectional analysis was conducted of data collected from 3,505 older adults recruited from the AmeriSpeak® Panel. Chronic pain was defined as pain on most or every day in the last three months. Nationally representative chronic pain prevalence estimates were computed by incorporating study-specific survey design weights. Logistic regression analyses evaluated differences in chronic pain status as a function of sociodemographic characteristics (e.g., gender, race/ethnicity, socioeconomic status). Results indicated that 37.8% of older adults reported chronic pain. Compared to White older adults, Black (OR = 0.6, 95% CI: 0.4-0.8) and Asian (OR = 0.2, 95% CI: 0.1-0.8) older adults were less likely to report chronic pain. The

Corresponding Author: Lisa R. LaRowe, PhD, Mongan Institute Center for Aging and Serious Illness, Massachusetts General Hospital, Department of Medicine, Harvard Medical School, 100 Cambridge Street, Suite 1600, Boston, MA 02114, llarowe@mgh.harvard.edu.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

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prevalence of chronic pain was also lower among those who reported the highest (vs. lowest) household income (OR = 0.6, 95% CI: 0.4-0.8). Those who were not working due to disability (vs. working as a paid employee) were more likely to report chronic pain (OR = 3.2, 95% CI: 2.1-5.0). This study was the first to recruit a large, representative sample of older adults to estimate the prevalence of chronic pain and extends prior work by identifying sub-groups of older adults that are disproportionately affected.

Perspective: This study was the first to estimate the prevalence and sociodemographic correlates of chronic pain among a large, representative sample of U.S. older adults. Findings underscore the high prevalence of chronic pain and highlight disparities in chronic pain prevalence rates among this historically understudied population.

Keywords

chronic pain; geriatric; aging; disparities; AmeriSpeak

Introduction

Chronic pain (i.e., pain that persists or recurs for ≥3 months[1]) affects more than 1 in 5 adults in the United States (U.S.) and results in a substantial burden on individuals and healthcare systems.[2-4] Converging evidence suggests that the prevalence of chronic pain increases with age.[5-7] Moreover, older adults (aged ≥65 years) experience unique consequences of chronic pain (e.g., frailty, mobility limitations, decreased quality of life, accelerated cognitive decline[7-11]) and challenges with chronic pain management (e.g., high rates of polypharmacy/multimorbidity, frequent occurrence multisite pain, social isolation[12-14]).

Recent epidemiologic studies estimated that 27-34% of adults aged 65 years and older experience chronic pain.[5,6,15] However, these studies recruited general adult (aged ≥18) samples, and, although subgroup analyses of participants aged 65 and older were conducted, the overall studies were not focused specifically on a representative sample of older adults. Older adults warrant specific empirical attention, given that the absolute number of older adults with chronic pain is expected to increase given rising rates of multimorbidity and the anticipated growth of the older adult population over the next three decades.[16,17] Moreover, it is important to note that none of the aforementioned epidemiologic studies investigated sociodemographic disparities in the prevalence of chronic pain in older adults. In the general adult population, sociodemographic disparities in pain have widened over time.[18] For example, lower household income and lower levels of educational attainment are associated with an increased risk for chronic pain.[18] In addition, Native American and multiracial adults demonstrate higher rates of chronic pain.[19,20] However, disparities in chronic pain among older adults remain unknown. This gap in knowledge is alarming, given evidence that sociodemographic correlates of health are different in older vs. younger populations.[21-25] Moreover, it is important to identify subgroups of older adults who require additional support so that services can be matched to specific needs. Thus, the goals of this study were to verify the prevalence of chronic pain among a nationally representative sample of older adults in the U.S. and evaluate for sociodemographic characteristics associated with higher rates of chronic pain.

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Methods

Detailed information about the study methods has been published elsewhere.[26]

Design and Participants

This study involved collecting information from a representative sample of older adults (age ≥65, consistent with prior work[27-32]) selected from the AmeriSpeak® Panel between September-October 2022. AmeriSpeak, which is funded and operated by the National Opinion Research Center (NORC) at the University of Chicago, is a probability-based panel that utilizes state-of-the-art approaches to ensure at least 97% sample coverage of the U.S. population.[33,34] Randomly selected U.S. households, including those not recorded on the U.S. Postal Service Computerized Delivery Sequence file but identified through NORC in-person fieldwork, are sampled using area probability and address-based sampling, with a known, non-zero probability of selection from the NORC National Sample Frame. In 2021, AmeriSpeak launched an initiative to further increase recruitment of adults aged ≥50 years. To ensure that even hard-to-reach populations are represented, recruitment involves an extensive non-response follow-up program that includes enhanced respondent incentives and in-person, face-to-face recruitment by professional field interviewers.[33]

The sample for the current study was selected from the AmeriSpeak panel using sampling strata based on age, race/Hispanic ethnicity, education, and gender. Sample selection took into account the expected differential survey completion rates across the sampling strata as well as recent participation in AmeriSpeak surveys. A total of 8,757 panelists aged ≥65 were selected to receive an invitation to complete the chronic pain screening question and subsequent baseline survey. Panelists were invited via their stated mode preference (i.e., web, phone). Of the invited panelists, 3,505 elected to complete the screening item, representing a 40% screener completion rate. Importantly, all analyses incorporated study-specific weights, which adjusted for selection probabilities from the AmeriSpeak panel and adjusted for non-response to the current study's screener question. Non-response adjusted weights were then raked to representative population benchmarks provided by the Current Population Survey (2021 March Supplement).[35] Because this study sampled respondents from the nationally representative AmeriSpeak sample frame, and applied study-specific weights to adjust for sample selection, non-response, and rake to representative population totals provided by the U.S. Bureau of Labor Statistics' Current Population Survey, estimates are generalizable to the U.S. population of adults aged 65 and over. To verify the prevalence of chronic pain among this representative sample of U.S. older adults, the current study focused on the panelists who completed the chronic pain screening question. Subsequent papers will provide additional details on differences between participants who did and did not report chronic pain, using data from the subsample who completed all of the study questionnaires.

All procedures were conducted in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments. This study was approved by the Institutional Review Board at Massachusetts General Hospital (#2021P002387). Informed consent was implied by voluntary completion of the survey. Additional details regarding the study design were described previously.[26]

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Measures

Chronic Pain—A single-item chronic pain screener was used to identify participants with chronic pain: “In the past 3 months, how often did you have pain?”. Response options included “never”, “some days”, “most days”, “every day”, or “don’t know”. Consistent with prior work,[6] participants who reported pain on “most days” or “every day” in the past 3 months were classified as having chronic pain. Those who responded “never”, “some days”, “don’t know”, or skipped this item were classified as not having chronic pain.

Sociodemographic Factors—Sociodemographic data were obtained from the AmeriSpeak® Panel. AmeriSpeak® panelists are required to report sociodemographic information, including age, gender (male vs. female), race/ethnicity (i.e., White, Black/African American, Asian, Multiracial, other), marital status (i.e., married, widowed, divorced, separated, never married), highest level of education (i.e., less than high school, high school graduate or equivalent, vocational school/some college/Associate’s degree, Bachelor’s degree, post-graduate study/professional degree), employment status (i.e., working, not working, retired, disabled), income (i.e., <$30,000, $30,000 - $59,999, $60,000 - $99,999, ≥ $100,000), and location of residence (i.e., Northwest, Midwest, South, West).

Data Analysis

Analyses were conducted using SAS 9.4 (SAS Institute, Inc, Cary, NC). For all of the analyses, nationally representative estimates were computed by incorporating study-specific survey design weights. These study-specific weights were computed as the product of the final AmeriSpeak panel weights and the inverse of the probabilities of selection under the study sample design. All survey completers received a study-specific final weight, which adjusted the base weights to address survey non-response through a weighting class method. The weighted prevalence of chronic pain and associated two-sided 95% confidence intervals were calculated for the entire sample and as a function of sociodemographic characteristics. Logistic regression was used to evaluate for differences in chronic pain status as a function of sociodemographic characteristics. Two participants who elected to complete the chronic pain screening item did not select a response option and thus were classified as not having chronic pain.

Results

Participant Characteristics

Participants included 3,505 older adults. Data were weighted to represent the U.S. population of older adults. The mean age of older adults was 73.9 years (95% CI: 73.6-74.2) and 54.8% (95% CI: 52.5-57.2) were female. Approximately 10% (95% CI: 7.4-10.5) of the sample identified as Black/African American and 9% (95% CI: 7.4-10.5) identified as Hispanic. The majority of older adults were retired (72.4%; 95% CI: 70.3-74.5) and one-quarter reported an annual household income of less than $30,000 (25.8%; 95% CI: 23.5-28.0). Additional sociodemographic characteristics are listed in Table 1.

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Prevalence of Chronic Pain

In 2022, an estimated 37.8% (95% CI: 35.6-40.1) of U.S. older adults reported chronic pain. As shown in Figure 1, 19.6% (95% CI: 17.7-21.4) reported pain that occurred “every day” over the past three months and 18.2% (95% CI: 16.5-20.0) reported pain that occurred on “most days”. Only 11.2% of older adults (95% CI: 9.4-13.0) reported no pain in the past three months.

Sociodemographic Characteristics Associated with Chronic Pain

Table 2 lists the prevalence of chronic pain associated with measured sociodemographic characteristics. Compared with White older adults (39.8%, 95% CI: 37.3-42.3), Black (27.2%, 95% CI: 21.7-32.7; *OR* = 0.6, 95% CI: 0.4-0.8) and Asian (13.8%, 95% CI: 0.0-28.2; *OR* = 0.2, 95% CI: 0.1-0.8) older adults were less likely to report chronic pain. The prevalence of chronic pain was also lower among older adults who reported a higher household income. In fact, only 29.2% (95% CI: 24.6-33.8) of those in the highest income bracket (≥$100,000) reported chronic pain, compared with 42.6% (95% CI: 37.5-47.7; *OR* = 0.6, 95% CI: 0.4-0.8) of those in the lowest income bracket (<$30,000). In terms of employment status, older adults who were not working due to disability were more likely to report chronic pain (62.1%, 95% CI: 53.0-71.2) than those who were working as a paid employee (33.9%, 95% CI: 29.1-38.8; *OR* = 3.2, 95% CI 2.1-5.0). Chronic pain was reported by 38% (95% CI: 34.9-40.5) of adults aged 65-74, 37.0% (95% CI: 33.0-41.0) of adults aged 75-84, and 42.8% (95% CI: 33.2-52.5) of adults aged ≥85, however, these differences were not statistically significant. Moreover, no differences in chronic pain prevalence were associated with gender, marital status, level of educational attainment, or geographic region.

Discussion

The current study was the first to recruit a large, representative sample of U.S. older adults to examine the prevalence and correlates of chronic pain. The prevalence of chronic pain in this population was 37.8%. This estimate is higher than the 27.6% - 34.3% reported in previous studies that used a similar definition/measure of chronic pain (i.e., a single item that identifies individuals who experience pain on most or every day).[5,6,15] For example, in the National Health Interview Survey, 30.8% of adults aged 65 and older reported chronic pain in 2019.[6] While it is possible that differences in study design (e.g., sampling techniques) between the National Health Interview Survey participants and the AmeriSpeak panel explain the observed differences in prevalence rates, the current findings may reflect a true rise in prevalence of chronic pain in older adults. Indeed, one potential explanation is that growing rates of multimorbidity in older adults[17] and the COVID-19 pandemic may have contributed to increases in chronic pain.[36-39] Emerging evidence suggests that COVID-19 infection increases the risk for the development and worsening of chronic pain.[36,38,39] Moreover, the pandemic was associated with numerous psychosocial effects (e.g., higher rates of anxiety/depression, social isolation, loneliness[40-42]) that are known risk factors for chronic pain in older adults.[43] Additional work is still needed to examine the role of these factors in chronic pain prevalence and outcomes among older adults.

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The current study extends prior work by identifying sub-groups of older adults that are disproportionately affected by chronic pain. Consistent with evidence of socioeconomic disparities in chronic pain prevalence in the general adult population, [44,45] older adults with a lower income were more likely to report chronic pain. Moreover, older adults who were not working due to disability were three times as likely to report chronic pain. This relationship may be explained by a number of factors, including: psychological (e.g., stress, trauma, mood disorders[44,46,47]), medical (e.g., access to high-quality health care[48-50]), and environmental (e.g., occupational hazards, accessibility of living environment[51,52]) characteristics. Additional research is still needed to determine whether chronic pain prevalence differs as a function of wealth (i.e., an indicator of a person's financial resources amassed over a lifetime), because this construct more accurately reflects the economic resources of older adults, who are less likely to be in the paid labor force.[44]

This study builds on prior work that demonstrated racial differences in chronic pain prevalence.[19] In the U.S. general adult population, the prevalence of chronic pain is lower among Asian adults (versus other racial/ethnic groups).[19] Consistent with this evidence, the current study revealed that only 13.8% of Asian older adults reported chronic pain. However, the current findings should be interpreted with caution given the small number of Asian older adults in this study and wide confidence intervals surrounding the estimate. Moreover, some Asian Americans may under-report their pain because their cultures have been reported to value and encourage stoicism.[53,54] Contrary to prior findings from National Health Interview Survey data,[19] higher pain prevalence rates were not reported by multiracial older adults in the current study. Additional research is warranted to determine if racial and/or ethnic differences exist in prevalence rates of chronic pain in older adults.

No statistically significant differences in chronic pain status were found based on age, gender, marital status, level of education, or location of residence. For example, the prevalence of chronic pain among adults aged 65-84 was 38% and the prevalence of chronic pain among adults aged 85 and older was 43%. Prior data on age differences are mixed, with some studies suggesting that the prevalence of pain increases throughout older age[5] and others suggesting that the prevalence declines after age 85.[55] These differences warrant additional investigation and future work should examine both chronological age (i.e., the amount of time a person has been alive) and biological age (i.e., a marker of aging that considers various biological and physiological developmental factors, such as genetics, lifestyle, and comorbidities) as predictors of chronic pain.[56-58] Similarly, given prior data showing higher rates of chronic pain among women (vs. men).[20,59,60] additional work is needed to clarify sex/gender differences in the prevalence of chronic pain status among older adults.

This study has many strengths, including the recruitment of a large population-based sample from the AmeriSpeak® Panel; inclusion of both online and telephone data collection to engage segments of the population that are often underrepresented in research (e.g., low income and low literacy respondents); and utilization of survey design weights to generate nationally representative estimates. However, some limitations warrant consideration. First, more than half of participants who were approached did not complete the chronic pain screening item. To adjust for unequal selection probabilities, differential nonresponse across

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subpopulations, and frame coverage limitations, analyses incorporated statistical weights. Second, these analyses were cross-sectional. Future longitudinal studies are needed to examine bidirectional relationships between risk factors (e.g., socioeconomic status) and chronic pain in older adults. Additional studies are also needed to explore the impact of chronic pain on important patient-reported outcomes (e.g., physical/cognitive function, quality of life). Third, this study focused on the prevalence of chronic pain, defined as pain on more than half the days in the past 3 months. Future work is needed to examine the prevalence of specific pain diagnoses/types (e.g., cancer pain vs. non-cancer pain) and determine what proportion of older adults with chronic pain experience pain that interferes with life or work activities (i.e., high impact chronic pain[6]). Fourth, some subgroups of older adults were under-represented in this study due to the overall sample size (e.g., number of Asian respondents), which resulted in wide confidence intervals surrounding estimates. Future studies should also focus on the chronic pain experience of older adults from Asian backgrounds, given that they are the fastest-growing minority group of older adults in the U.S.[61]

Despite these limitations, the current findings underscore the high prevalence of chronic pain among U.S. older adults. When not managed effectively, chronic pain can contribute to declines in physical function, well-being, and quality of life among aging populations.[10,62] Moreover, nearly 1 in 5 older adults reported daily pain in this study and, thus, are at even greater risk for impairments in physical function, pain-related disability, and mood disorders.[63-66] Therefore, a clear need exists to develop and improve access to both pharmacologic and nonpharmacologic pain management interventions for older adults. Current pharmacologic options for pain management are limited in older adults,[43] given that this population may be particularly susceptible to adverse effects of analgesics.[67] Nonpharmacologic strategies offer promise, with a recent study demonstrating that older (vs. younger) adults can achieve equivalent or even greater benefits from mind-body programs for chronic pain.[68] However, older (vs. younger) adults use nonpharmacologic approaches to pain management at lower rates and report significant barriers to accessing these approaches (e.g., availability, cost/coverage, transportation, physical/cognitive limitations).[69-71] To ensure that all older adults can access evidence-based pain care, clinicians should work with patients to identify and overcome potential barriers to receiving care and advocate for legislation that increases availability and coverage of nonpharmacologic pain management strategies. Finally, given evidence that many clinicians have significant gaps in knowledge and training related to pain management,[72,73] medical settings who care for older adults should offer programs in pain management as a part of continuous medical education.

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Highlights

- Chronic pain prevalence was examined in a large, representative sample of U.S. older adults.
- An estimated 37.8% of U.S. older adults report chronic pain.
- Black and Asian (vs. White) older adults are less likely to report chronic pain.
- The prevalence of chronic pain is lower among older adults with higher income.

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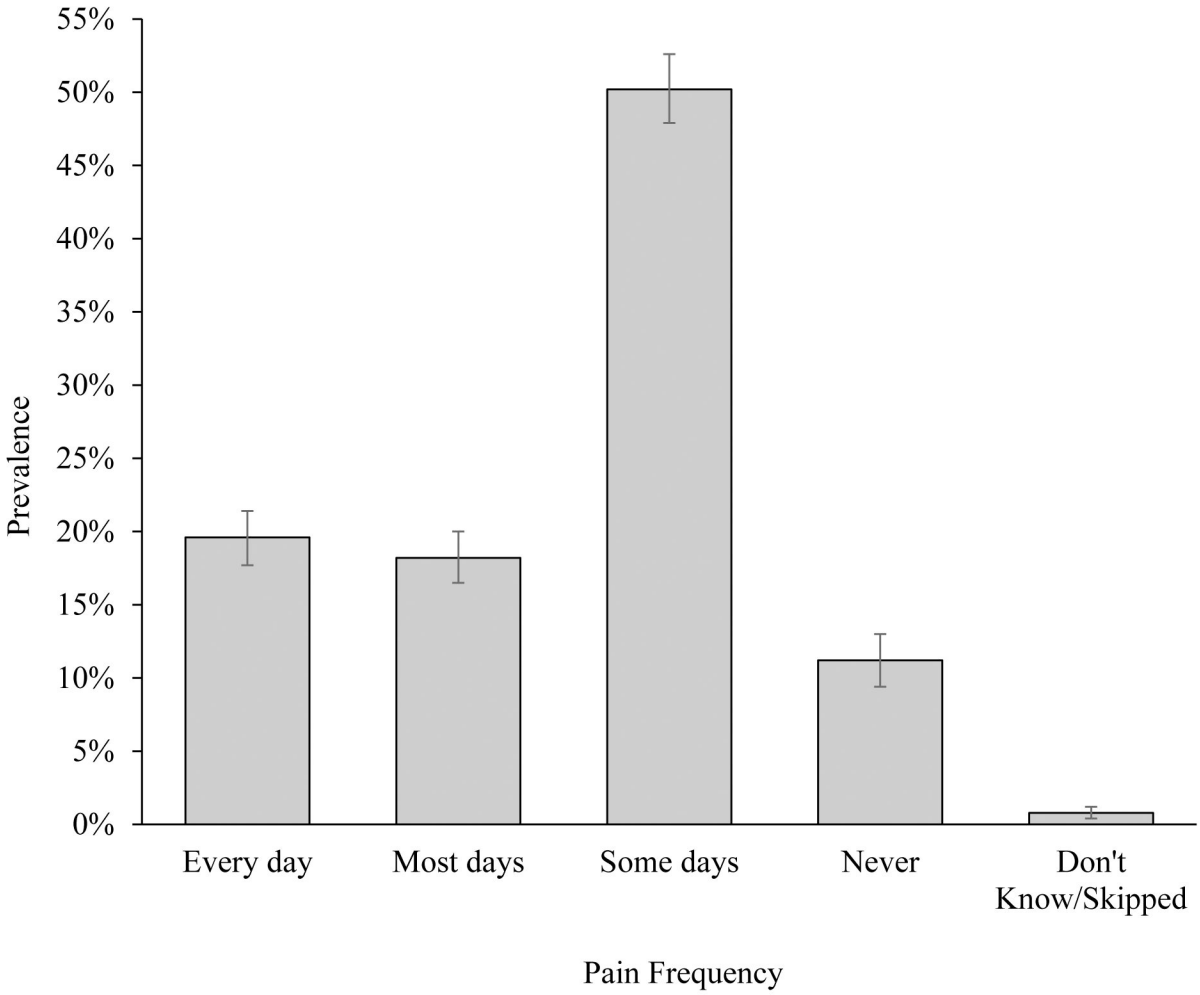


Figure 1.
How Often Older Adults Reported Having Pain Over the Past Three Months. *Note*: Error bars show 95% confidence intervals surrounding estimates.

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Table 1.

Sociodemographic Characteristics Weighted to Reflect National Estimates

	Total Sample
	Prevalence (95% CI)
Gender	
Male	45.17 (42.82-47.51)
Female	54.83 (52.49-57.18)
Age	
64-74	59.17 (56.82-61.2)
75-84	34.13 (31.85-36.41)
85+	6.70 (5.47-7.93)
Race	
White	81.86 (79.94-83.79)
Black/African American	10.00 (8.70-11.30)
Asian	2.11 (1.20-3.01)
Multiracial	2.71 (1.74-3.68)
Other	3.33 (2.34-4.32)
Ethnicity	
Not Hispanic	91.04 (89.50-92.58)
Hispanic	8.96 (7.42-10.50)
Marital status	
Married	52.14 (49.78-54.50)
Widowed	13.89 (12.34-15.43)
Divorced	17.63 (15.78-19.48)
Separated	7.50 (6.35-8.65)
Never married	8.85 (7.13-10.57)
Education	
Less than HS	10.85 (8.53-13.18)
HS graduate or equivalent	31.21 (29.07-33.35)
Vocational school/some college/Associate’s degree	25.11 (23.45-26.76)
Bachelor’s degree	14.76 (13.26-16.26)
Post-grad study/professional degree	18.07 (16.29-19.85)
Employment status	
Working	18.90 (17.06-20.74)
Not working	3.30 (2.55-4.04)
Retired	72.38 (70.30-74.46)
Disabled	5.42 (4.39-6.45)
Household income	
< $30,000	25.78 (23.54-28.02)
$30,000 - $59,999	31.79 (29.67-33.92)
$60,000 - $99,999	23.74 (21.83-25.64)

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	Total Sample
	Prevalence (95% CI)
≥ $100,000	18.69 (16.90-20.49)
Geographic region	
Northeast	18.46 (16.49-20.46)
Midwest	21.21 (19.43-22.99)
South	37.84 (35.57-40.12)
West	22.47 (20.51-24.44)
Metropolitan (metro)	
Metro area	83.03 (81.29-84.76)
Non-metro area	16.98 (15.24-18.71)

Abbreviations: CI = confidence interval, HS = high school.

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Table 2.

Weighted Prevalence Rates of Chronic Pain Among U.S. Older Adults by Sociodemographic Factors

	Unweighted Sample Size	Within-Group Prevalence of Chronic Pain (95% CI)	Statistics
Total	3505	37.8 (35.6-40.1)	--
Gender			
Male [ref]	1481	36.75 (33.40-40.11)	--
Female	2024	38.68 (35.66-41.70)	OR = 1.09, 95% CI: 0.90-1.32
Age			
64-74 [ref]	2123	37.73 (34.93-40.53)	--
75-84	1153	36.96 (32.96-40.96)	OR = 0.97, 95% CI: 0.79-1.19
85+	229	42.84 (33.19-52.50)	OR = 1.24, 95% CI: 0.82-1.87
Race			
White [ref]	2818	39.78 (37.31-42.25)	--
Black/African American	520	27.19 (21.67-32.71)	OR = 0.57, 95% CI: 0.42-0.76
Asian	25	13.75 (0.00-28.19)	OR = 0.24, 95% CI: 0.07-0.82
Multiracial	60	44.49 (26.58-62.40)	OR = 1.21, 95% CI: 0.58-2.53
Other	82	30.96 (15.73-46.19)	OR = 0.68, 95% CI: 0.33-1.40
Ethnicity			
Not Hispanic [ref]	3218	38.22 (35.88-40.55)	--
Hispanic	287	33.67 (25.77-41.56)	OR = 0.82, 95% CI: 0.57-1.19
Marital status			
Married [ref]	1784	37.50 (34.54-40.45)	--
Widowed	553	39.85 (33.79-45.90)	OR = 1.10, 95% CI: 0.83-1.46
Divorced	635	39.50 (33.81-45.19)	OR = 1.09, 95% CI: 0.83-1.43
Separated	239	41.93 (33.92-49.54)	OR = 1.19, 95% CI: 0.85-1.69
Never Married	294	29.75 (21.66-37.85)	OR = 0.71, 95% CI: 0.47-1.06
Education			
Less than HS [ref]	132	41.64 (30.33-52.94)	--
HS graduate or equivalent	850	37.76 (33.82-41.70)	OR = 0.85, 95% CI: 0.52-1.40
Vocational school/some ----------college/Associate's ---------- degree	1425	40.35 (37.12-43.58)	OR = 0.95, 95% CI: 0.58-1.54
Bachelor's degree	517	35.69 (30.60-40.78)	OR = 0.78, 95% CI: 0.46-1.30
Post-grad study/ ----------professional degree	581	33.79 (28.80-38.79)	OR = 0.72, 95% CI: 0.43-1.20
Employment Status			
Working [ref]	668	33.94 (29.13-38.75)	--
Not working	128	34.01 (23.41-44.62)	OR = 1.00, 95% CI: 0.60-1.69
Retired	2496	37.17 (34.51-39.84)	OR = 1.15, 95% CI: 0.90-1.47
Disabled	213	62.08 (52.96-71.20)	OR = 3.19, 95% CI: 2.05-4.96
Household income			
< $30,000 [ref]	875	42.59 (37.48-47.69)	--
$30,000 - $59,999	1151	38.32 (34.40-43.08)	OR = 0.84, 95% CI: 0.64-1.09

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	Unweighted Sample Size	Within-Group Prevalence of Chronic Pain (95% CI)	Statistics
$60,000 - $99,999	842	38.74 (34.40-43.08)	OR = 0.85, 95% CI: 0.65-1.13
≥ $100,000	637	29.17 (24.55-33.79)	OR = 0.56, 95% CI: 0.41-0.75
Geographic region			
Northeast [ref]	533	36.62 (31.10-42.14)	--
Midwest	929	38.89 (34.27-43.51)	OR = 1.10, 95% CI: 0.81-1.50
South	1262	36.93 (33.25-40.61)	OR = 1.01, 95% CI: 0.76-1.35
West	781	39.25 (34.57-43.92)	OR = 1.12, 95% CI: 0.82-1.52
Metropolitan			
Metro area [ref]	2935	37.08 (34.62-39.54)	--
Non-metro area	570	41.37 (35.88-46.86)	OR = 1.20, 95% CI: (0.93-1.54)

Abbreviations: U.S. = United States, ref = reference group, CI = confidence interval, OR = odds ratio, HS = high school.