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Racial and Ethnic Differences in the Prevalence of Patients With Arthritis and Severe Joint Pain and Who Received Provider Counseling About Physical Activity for Arthritis Among Adults Aged 18 Years or Older—United States, 2019

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Abstract

Objective.—This study examined the racial and ethnic differences in individuals with self-reported and doctor-diagnosed arthritis, severe joint pain, and provider counseling for physical activity among US adults with arthritis.

Methods.—We estimated prevalence by race and ethnicity among 31,997 adults aged ≥18 years in the 2019 National Health Interview Survey. We used multiple logistic regression models to investigate associations between outcomes and race and ethnicity.

Results.—Compared with non-Hispanic White adults (22.9%), we found a significantly higher age-adjusted prevalence of arthritis among American Indian/Alaska Native adults (30.3%). Among adults with arthritis, higher age-adjusted prevalence of severe joint pain among American Indian/Alaska Native (39.1%), non-Hispanic Black (36.4%), and Hispanic adults (35.7% vs 22.5% [White]) and higher provider counseling for physical activity among non-Hispanic Black adults (58.9% vs 52.1% [White]) were observed and could not be fully explained by differences in

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AUTHOR CONTRIBUTIONS

All authors were involved in drafting the article or revising it critically for important intellectual content, and all authors approved the final version to be published. Dr Wise had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Boring and Croft contributed to Acquisition of data. Boring had full access to all of the data.

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socioeconomic factors, body mass index, depression history, and comorbid conditions. Additional models also containing inability to pay medical bills and food insecurity did not explain racial and ethnic differences.

Conclusion.—Our findings highlight a need for multilevel interventions to mitigate social and environmental barriers to physical activity and eliminate disparities in individuals with arthritis and severe joint pain.

INTRODUCTION

In the United States, arthritis was diagnosed among 1 in 4 (23.7%) or 58.5 million adults in 2016–2018; activity limitations were reported by 43.9% or 25.7 million adults with arthritis.[1] Arthritis is a common driver of disability, costing at least $300 billion in arthritis-attributable direct and indirect annual costs nationwide in 2013.[2,3] By 2040, the number of US adults with doctor-diagnosed arthritis is projected to increase to 78.4 million, and the number of adults with arthritis-attributable activity limitations will increase to 34.6 million.[4] In 2017, American Indian/Alaska Native adults reported significantly higher age-adjusted prevalence of doctor-diagnosed arthritis (29.7%) compared with non-Hispanic White (24.1%), non-Hispanic Black (24.1%), and Hispanic adults (16.9%).[5] Severe joint pain was reported by 30.8% of US adults with arthritis in 2017 and was highest among non-Hispanic Black (50.9%), Hispanic (42.0%), and American Indian/Alaska Native adults (42.0%) who reported arthritis.[5] The most recent data among a representative sample of US adults in 2016 to 2018 showed that age-adjusted arthritis prevalence increased with increasing levels of body mass index (BMI) and psychological distress and declined with increasing levels of self-rated health and income.[1] This study also found a higher age-adjusted prevalence of arthritis and arthritis-attributable activity limitations among non-Hispanic White, American Indian/Alaska Native, and non-Hispanic Black respondents than among Hispanic and Asian adults.[1]

Arthritis-related health care expenditures for persons who are not White were significantly lower than non-Hispanic White respondents, independent of health care access and functional disability, highlighting the need to examine racial and ethnic differences in health care engagement among adults with arthritis.[6] Difficulties paying for expenses are associated with rheumatoid arthritis severity, particularly in low-income house-holds.[7] An earlier review of osteoarthritis disparities found that individual-level risk factors, like BMI and older age, did not fully explain racial disparities.[8] A recent review of studies on disparities in osteoarthritis outcomes notes that racial disparities in treatment are well-documented and likely due to patient-, provider-, and health care–related factors that warrant further investigation.[9] Studies using a recent, nationally representative sample of US adults found rural residence, poverty, and mental health conditions were linked with a higher prevalence of arthritis and adverse arthritis-related outcomes.[1,10]

Physical activity can help people manage arthritis symptoms such as joint pain.[11] Physical activity interventions that are arthritis appropriate and inclusive of persons with disabilities have proven benefits, including improved aerobic activity, higher self-rated health, and reduced depression, fatigue, and pain.[12] Health care providers can help patients manage

arthritis pain by recommending exercise and physical activity interventions recognized by the Centers for Disease Control and Prevention (CDC) and the Osteoarthritis Action Alliance. Physical activity promotion interventions in primary care are associated with a small to moderate positive effect on increasing physical activity levels in patients.[13] Among US adults with doctor-diagnosed arthritis in 2019, 70.8% reported having received health care provider counseling for physical activity.[14] Age-adjusted prevalence of physical activity counseling among adults with arthritis was reported for non-Hispanic Black (76.0%), Hispanic (75.3%), Asian (75.1%), non-Hispanic adults in other race groups (72.6%), non-Hispanic White (69.2%), and American Indian/Alaska Native (67.8%) adults.[14]

Earlier research has investigated arthritis prevalence and arthritis-related outcomes, like joint pain, by race and ethnicity using a limited set of health and demographic factors. However, there is a notable lack of research on these outcomes and their association with social determinants in the context of racial and ethnic disparities that use robust measures and the latest nationally representative data. This study addresses this gap by assessing racial and ethnic disparities in individuals with arthritis and severe joint pain and who received health care provider counseling for physical activity among a representative sample of US adults with arthritis using the 2019 National Health Interview Survey (NHIS). These analyses also examine whether indicators of a history of depression, number of chronic conditions, BMI, and selected social determinants help explain these disparities. The findings of this study may provide insight into whether there are disparities in severe joint pain and health care provider counseling for physical activity among specific racial and ethnic populations of adults with arthritis and whether those disparities would suggest a need for additional resources to advance health care providers counseling on physical activity among adults with arthritis; the findings might also suggest a need for additional resources and programs to achieve health equity.

PATIENTS AND METHODS

The NHIS is a nationally representative, cross-sectional face-to-face survey of the US civilian, noninstitutionalized population residing in 50 states and the District of Columbia. The NHIS is conducted annually by the National Center for Health Statistics at the CDC.[15] We analyzed data from the 2019 NHIS for 31,977 adult respondents aged ≥18 years; the response rate was 59.1% of eligible adult participants.[15] Race and ethnicity included six categories: non-Hispanic White, non-Hispanic Black, Hispanic, non-Hispanic Asian, American Indian/Alaska Native, and other single and multiple races. Estimates for the racial and ethnic groups “other single and multiple races” are not reported due to small sample sizes, but the category is included in overall estimates.

Arthritis was defined by a “yes” response to, “Have you ever been told by a doctor or other health care professional that you have arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?” The last three are among more than 100 conditions identified as arthritis conditions.[16] Severe joint pain was defined among adults with arthritis who reported pain with a response of ≥7 to the question, “Please think about the past 30 days, keeping in mind all of your joint pain or aching and whether or not you have taken medication. During the past 30 days, how bad was your joint pain on average? Please answer on a scale of 0 to 10,

where 0 is no pain or aching, and 10 is pain and aching as bad as it can be." Receipt of health care provider counseling for physical activity was defined among those with arthritis by a "yes" response to, "Has a doctor or other health professional ever suggested physical activity or exercise to help your arthritis or joint symptoms?"

Comorbid chronic conditions, including asthma, cancer, chronic obstructive pulmonary disease, coronary heart disease (coronary heart disease, angina pectoris, and myocardial infarction), diabetes (not including prediabetes and gestational), high blood pressure, and stroke, were based on affirmative responses to having ever been told by a doctor or other health care provider that the respondent had that condition. BMI was calculated based on self-reported height and weight (in kilograms per square meter). Depression was defined as a respondent reporting ever being told by a doctor or other health care provider that they had any type of depression. Social determinants included education, employment, health insurance, having a primary care provider, nonmetropolitan versus metropolitan residency, inability to pay medical bills, having subsidized housing, renting versus owning a home, and food insecurity (defined as those families reporting "low food security" or "very low food security" based on 10 food security status classification questions as recommended by the US Department of Agriculture Economic Research Service).[15]

Distributions of selected characteristics were assessed for the overall US adult population based on a sample of 31,997 adults aged ≥18 years. The estimated prevalence of individuals with severe joint pain and who received health care provider counseling was assessed by race and ethnicity among 8,214 respondents who reported doctor-diagnosed arthritis. Unadjusted and adjusted prevalence estimates and prevalence ratios with 95% confidence intervals (CIs) were generated for individuals with arthritis and severe joint pain and who received health care provider counseling. Age-adjusted estimates were generated using logistic regression models. Partial logistic regression models adjusted estimates for age, sex, education level, employment status, BMI, depression history, and number of comorbid chronic conditions. Full multivariable models also included the inability to pay medical bills and food insecurity. The fully adjusted logistic regression models were constructed by forward selection, with model significance assessed at each stage using the Wald F test statistic. Model building ended when potential multicollinearity exceeded the threshold of ≥30 as measured by condition index. Additionally, variance inflation factors for all variables in the models remained below 2.

All analyses accounted for the complex sampling design and used SAS (version 9.4; SAS Institute) and SUDAAN (version 11.0; RTI International). Sampling weights were applied to generate nationally representative estimates and to adjust for non-response.[17] Differences were assessed using *t*-tests, and we reported all differences significant at *P* values less than 0.05. Estimates were deemed unreliable and suppressed if the absolute CI width was ≥0.30, or the absolute CI width was between 0.05 and 0.30, and the relative CI width was >130%.[18]

RESULTS

Sample characteristics.

Table 1 shows the weighted distribution of selected characteristics overall, among all adults, and by racial and ethnic groups. Non-Hispanic White adults had a higher proportion of adults aged ≥65 years (25.3%) and retired adults (21.9%) than other racial and ethnic groups, a lower proportion of women respondents (50.9%) than non-Hispanic Black adults, and a lower proportion of adults with less than a high school education (7.9%) than other racial and ethnic groups, except non-Hispanic Asian adults. Employment was highest among Hispanic adults (70.6%), and inability to work or disability was highest among American Indian/Alaska Native (14.0%) and non-Hispanic Black (11.2%) adults. Having a BMI classified as obese was highest among non-Hispanic Black (40.8%), American Indian/Alaska Native (39.4%), and Hispanic (35.8%) adult groups compared with non-Hispanic White adults (31.5%). American Indian/Alaska Native adults had the highest proportion of adults reporting three or more comorbid conditions (12.6%) and ever having depression (24.5%). Compared with non-Hispanic White adults, reporting having no health insurance, no primary care provider, food insecurity, and inability to pay medical bills was higher among non-Hispanic Black, Hispanic, and American Indian/Alaska Native adults. More non-Hispanic Black adults reported subsidized housing (10.4%) than other groups. American Indian/Alaska Native adults were more likely to live in nonmetropolitan areas (47.6%) than other groups.

Arthritis prevalence.

Unadjusted arthritis prevalence was significantly higher among non-Hispanic White adults (24.9%) compared with non-Hispanic Black (20.2%), Hispanic (12.2%), and Asian (10.4%) adults; arthritis prevalence among non-Hispanic White adults did not differ significantly from American Indian/Alaska Native adults, the group with the highest prevalence (29.5%; Table 2). Overall, the unadjusted prevalence of doctor-diagnosed arthritis increased with age, number of chronic conditions, and BMI levels and decreased with educational attainment. Adults who were retired—for all racial and ethnic groups—or were unable to work or disabled—among non-Hispanic White, non-Hispanic Black, and Hispanic adults—had higher arthritis prevalence compared with employed adults. The unadjusted prevalence of arthritis was significantly higher among those reporting ever having depression among most racial and ethnic groups except for Asian adults. Among non-Hispanic White, non-Hispanic Black, and Hispanic groups, adults with health insurance coverage were more likely to report doctor-diagnosed arthritis than those without it. Non-Hispanic White and Hispanic respondents with a primary care provider were also more likely to report doctor-diagnosed arthritis than those without one. Among non-Hispanic White, non-Hispanic Black, and Hispanic adults, the unadjusted prevalence of arthritis was higher among those reporting food insecurity, an inability to pay medical bills, or living in subsidized housing. Living in a rural area was significantly associated with a higher prevalence of arthritis among non-Hispanic White and non-Hispanic Black adults.

Compared with non-Hispanic White adults (22.9%), the age-adjusted prevalence of doctor-diagnosed arthritis was significantly lower for Hispanic (16.0%) and Asian adults (11.8%).

It was significantly higher among American Indian/Alaska Native adults (30.3%) (Table 3). After adding age, sex, education level, employment status, BMI level, depression history, number of chronic conditions, inability to pay medical bills, and food insecurity as explanatory variables to the partially adjusted multivariable model, there was no significant difference in adjusted arthritis prevalence between American Indian/Alaska Native (24.5%) adults and non-Hispanic White (23.0%) adults. Adding the inability to pay medical bills and food insecurity to the model did not further explain any racial and ethnic differences.

Severe joint pain.

Among adults with arthritis, age-adjusted prevalence of severe joint pain was significantly higher among American Indian/Alaska Native (39.1%), non-Hispanic Black (36.4%), and Hispanic (35.7%) adults compared with non-Hispanic White (22.5%) adults (Table 3). These significant racial and ethnic differences remained after controlling for socioeconomic characteristics, BMI, depression status, and comorbid conditions. Additional models, including inability to pay medical bills and food insecurity, did not explain the racial and ethnic differences.

Receipt of health care provider counseling for physical activity.

Among adults with arthritis, the adjusted prevalence of receiving health care provider counseling for physical activity was significantly higher for non-Hispanic Black (57.5%) and Hispanic (57.6%) adults compared with non-Hispanic White adults (51.7%) after adjustment for differences in socioeconomic characteristics, BMI, depression status, and comorbid conditions. Models that included the inability to pay medical bills and food insecurity did not further explain racial and ethnic differences.

DISCUSSION

Arthritis and arthritis activity limitations disproportionately affect certain racial and ethnic groups of US adults. Although arthritis prevalence is higher among non-Hispanic White and American Indian/Alaska Native adults, non-Hispanic Black and Hispanic adults with arthritis had a higher prevalence of severe joint pain compared with non-Hispanic White adults after accounting for differences in socioeconomic factors, BMI, depression status, and comorbid conditions as explanatory variables. Furthermore, non-Hispanic Black and Hispanic adults with arthritis were more likely to report that a health care provider counseled them about physical activity. The significantly greater likelihood of receiving this counseling among non-Hispanic Black and Hispanic adults with arthritis compared with non-Hispanic White adults remained after accounting for indicators of socioeconomic status, physical and mental health, food insecurity, and inability to pay bills. The current findings update national estimates on arthritis and related outcomes by race and ethnicity in the United States.[19]

The US Department of Health and Human Services has declared achieving health equity and addressing social determinants of health a priority, as demonstrated through the Healthy People 2030 guidance.[20] Achieving health equity means addressing disparities in health outcomes and recognizing social and environmental conditions that shape those disparities that are based on race and ethnicity, age, disability, sex and sexual identity, socioeconomic

status, and other social categories.[21] Our estimates present an emerging awareness of the very high prevalence of arthritis and severe joint pain in American Indian/Alaska Native adults; this prevalence has not been addressed with public health actions that prioritize specific populations that are at higher risk. Our findings are also consistent with current research on arthritis-related clinical pain, joint function, and disability related to osteoarthritis, which suggests US non-Hispanic Black adults are more likely to experience greater pain and disability compared with their non-Hispanic White counterparts, who have a higher arthritis prevalence.[22,23] Moreover, indicators of food insecurity and inability to pay medical bills did not explain the observed racial and ethnic disparities in individuals with arthritis, severe joint pain, and likelihood of receiving physical activity counseling from health care providers. Previous analysis of racial and ethnic disparities in arthritis suggested that reasons for these disparities include health care access, use of health care services, and language barriers, as well as differences in the prevalence of risk factors, disability, and type of occupation.[24] A recent study on the protective effect of socioeconomic status among adults with knee osteoarthritis found that although higher income was linked to lower odds of obesity, this protective effect was significantly reduced for Black adults compared with White adults. Research increasingly calls for further examination of social and structural contributors to arthritis prevalence and disparities.[1,6,19,24–26]

The prevalence of health care provider counseling on physical activity was lowest among non-Hispanic White and Asian respondents, although estimates for all groups were lower than 60%. Previous studies analyzing this indicator by race and ethnicity have found similar patterns in which rates of health care provider counseling on physical activity were higher among respondents who were Black or Latino respondents, as well as women, those with overweight, those at least middle aged, and those with higher levels of education.[27,28] Reasons for these disparities in physician counseling for physical activity are unclear, but providers may perceive certain subgroups to have a greater need for physical activity advice and focus on these patients.[27] A previous study found Hispanic and non-Hispanic Black adults with arthritis report higher levels of physical inactivity compared with non-Hispanic White adults with arthritis.[5] A previous analysis found receipt of health care providers' recommendation for physical activity to help arthritis and joint pain was positively associated with meeting aerobic and strengthening recommendations of 150 minutes of moderate to vigorous physical activity per week, having arthritis-associated activity limitations, and more severe joint pain; in particular, the associations were found across all racial and ethnic groups.[29] That study also observed that 40% of US adults with arthritis reported not receiving a physician's recommendation for exercise to relieve symptoms, similar to our finding.[30] An analysis of a nonrepresentative sample of US primary care physicians showed that 88.2% recommended walking, swimming, or cycling to patients with arthritis. But 65.5% had not recommended evidence-based, arthritis-appropriate physical activity programs (eg, Walk With Ease, Enhance Fitness, Fit and Strong, Arthritis Foundation Aquatic and Exercise Programs, and Active Living Every Day) largely because they were not aware of the availability of such programs.[30] Additional professional education efforts and messages are needed to create provider awareness of these programs to increase physical activity among adults with arthritis. A potential approach is the evidence-based Exercise is Medicine initiative, which encourages physical activity

counseling in health care. Introduced in 2007 by the American Medical Association and the American College of Sports Medicine, the program encourages providers to use physical activity in their clinical assessment and treatment of patients with chronic diseases.[31]

Physical activity can lessen severe joint pain and disability and benefit the physical and mental health of individuals with arthritis.[11] However, adults' ability to engage in physical activity is partly determined by their access to the built and social environment.[8,32] A neighborhood's walkability and presence of transit stops, libraries, museums, and movies were associated with adults meeting physical activity recommendations of 150 minutes of moderate to vigorous physical activity per week.[31] Evidence shows that socially and economically disadvantaged groups live in environments that have characteristics that are not conducive to physical activity, including real or perceived safety issues related to traffic and crime; physical and social disorders; reduced access to green space, parks, and recreational facilities; and poor sidewalk conditions.[33] Strategies to reduce arthritis burden and eliminate disparities can consider environmental barriers to physical activity and develop interventions at the policy, neighborhood, and health care system levels to mitigate them.

This research is subject to at least three limitations. First, these cross-sectional survey data were self-reported and are subject to recall and social desirability bias. Second, if some racial and ethnic groups are less likely to have access to health care than non-Hispanic White adults, then they may also be less likely to be diagnosed with arthritis, resulting in an underestimate of the prevalence of arthritis in these populations. Third, differences in outcomes among race and ethnicity groups could not be explained by the models limited by the variables included in the NHIS. Other variables capturing different aspects of social determinants of health, like the built environment, could explain the differences.

This study's findings highlight a need for public health efforts to continue focusing on increasing physical activity availability and accessibility to people disproportionately affected by arthritis, including but not limited to uninsured adults, adults with severe joint pain, retired adults, adults with disabilities or depression, and adults from racial and ethnic groups with high arthritis prevalence or burden. Health care providers should continue to encourage physical activity to help reduce arthritis symptoms and limitations. Campaigns that inform health care providers about evidence-based physical activity programs and patient populations most in need of them can increase the physician recommendation of arthritis-appropriate programming for patients who would benefit from increased physical activity. Additional efforts to modify existing physical infrastructure (eg, sidewalks, parks, green spaces) that support physical activity for people with arthritis and implement physical activity recommendations and evidence-based interventions through collaborations with key partners (eg, transportation, planning, parks and recreation, etc) are needed.

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SIGNIFICANCE & INNOVATIONS

- American Indian/Alaska Native adults had a significantly higher age-adjusted prevalence of arthritis (30.3%) compared with non-Hispanic White adults (22.9%).
- American Indian/Alaska Native (39.1%), non-Hispanic Black (36.4%), and Hispanic adults (35.7% vs 22.5% [White]) had higher age-adjusted prevalence of severe joint pain.
- Public health practitioners and health care providers who work with people who have arthritis can develop interventions at the policy, neighborhood, and health care system levels that mitigate barriers to physical activity and reduce arthritis burden and disparities.

Table 1.

Weighted percentage and 95% CI of selected characteristics among adults aged ≥18 years by race and ethnicity: National Health Interview Survey, United States, 2019*

Characteristic	Overall (n = 31,997)[a]	Non-Hispanic White (n = 21,915)	Non-Hispanic Black (n = 3,483)	Hispanic (n = 4,152)	Non-Hispanic Asian (n = 1,648)	Non-Hispanic American Indian/Alaska Native (n = 460)
Age group, % (95% CI)						
18–44 y	46.0 (45.1–46.8)	40.5 (39.5–41.5)	50.7 (48.5–52.9)	59.5 (57.7–61.4)	52.3 (49.1–55.6)	47.2 (41.8–52.7)
45–64 y	33.0 (32.3–33.6)	34.2 (33.4–35.0)	33.1 (31.2–35.1)	29.3 (27.6–31.1)	31.1 (28.2–34.2)	34.0 (28.9–39.5)
≥65 y	21.1 (20.5–21.6)	25.3 (24.5–26.0)	16.2 (14.8–17.7)	11.1 (10.0–12.4)	16.6 (14.5–18.9)	18.8 (15.3–22.8)
Sex, % (95% CI)						
Men	48.3 (47.6–49.0)	49.1 (48.3–49.9)	44.9 (42.7–47.1)	48.1 (46.3–49.9)	47.7 (44.8–50.5)	44.6 (39.3–50.0)
Women	51.7 (51.0–52.4)	50.9 (50.1–51.7)	55.1 (52.9–57.3)	51.9 (50.1–53.7)	52.3 (49.5–55.2)	55.4 (50.0–60.7)
Education level, % (95% CI)[b]						
Less than high school graduate	12.4 (11.8–13.2)	7.9 (7.3–8.5)	12.3 (10.7–14.1)	31.1 (28.7–33.5)	9.3 (7.2–11.8)	19.0 (13.7–25.7)
High school graduate or equivalent	27.5 (26.7–28.2)	27.3 (26.4–28.1)	33.5 (31.5–35.5)	28.3 (26.6–30.2)	15.7 (13.4–18.4)	24.8 (19.4–31.1)
Some college or technical school	31.1 (30.4–31.9)	32.5 (31.6–33.4)	34.0 (31.8–36.2)	25.7 (24.1–27.4)	21.5 (18.8–24.5)	40.1 (34.5–45.9)
Bachelor degree or higher	29.0 (28.1–29.9)	32.4 (31.3–33.4)	20.2 (18.6–21.9)	14.9 (13.6–16.3)	53.5 (50.2–56.8)	16.1 (12.3–20.9)
Employment status, % (95% CI)[c]						
Employed/self-employed	64.6 (63.8–65.4)	63.3 (62.4–64.2)	62.4 (60.0–64.7)	70.6 (68.7–72.5)	66.0 (63.0–68.9)	56.8 (51.4–62.0)
Unemployed	2.0 (1.8–2.2)	1.6 (1.4–1.8)	4.2 (3.1–5.7)	2.1 (1.6–2.6)	1.0 (0.5–2.0)	3.3 (1.8–5.8)
Retired	18.0 (17.4–18.5)	21.9 (21.2–22.7)	14.1 (12.7–15.6)	8.1 (7.2–9.0)	12.6 (10.7–14.8)	16.5 (13.4–20.1)
Unable to work/disabled	6.5 (6.2–6.9)	5.9 (5.5–6.4)	11.2 (9.9–12.6)	6.2 (5.2–7.4)	3.3 (2.1–5.1)	14.0 (10.0–19.4)
Other	8.9 (8.4–9.4)	7.3 (6.8–7.8)	8.1 (6.8–9.5)	13.0 (11.7–14.5)	17.1 (14.8–19.7)	9.4 (6.4–13.5)
Number of chronic conditions, % (95% CI)[d]						
None	59.5 (58.7–60.2)	57.0 (56.1–57.9)	54.9 (52.8–56.9)	68.4 (66.5–70.3)	71.2 (68.3–74.0)	50.2 (44.8–55.5)
One or two	34.3 (33.6–35.0)	36.1 (35.3–36.9)	37.6 (35.7–39.7)	27.3 (25.7–29.0)	26.9 (24.3–29.7)	37.2 (32.4–42.3)
Three or more	6.3 (5.9–6.6)	6.9 (6.5–7.3)	7.5 (6.6–8.5)	4.2 (3.5–5.1)	1.9 (1.2–3.0)	12.6 (8.9–17.7)
Body mass index level, % (95% CI)						
Normal/underweight (<25 kg/m^2)	34.0 (33.3–34.7)	35.1 (34.3–35.9)	25.9 (24.0–28.0)	26.2 (24.5–27.9)	59.7 (56.7–62.5)	27.5 (22.8–32.7)
Overweight (25–29.9 kg/m^2)	33.9 (33.3–34.6)	33.4 (32.6–34.2)	33.3 (31.4–35.3)	38.1 (36.3–39.9)	30.2 (27.5–33.1)	33.2 (27.9–38.9)

Characteristic	Overall (n = 31,997)[a]	Non-Hispanic White (n = 21,915)	Non-Hispanic Black (n = 3,483)	Hispanic (n = 4,152)	Non-Hispanic Asian (n = 1,648)	Non-Hispanic American Indian/Alaska Native (n = 460)
Obese (≥30 kg/m^2)	32.1 (31.4–32.8)	31.5 (30.6–32.4)	40.8 (38.8–42.8)	35.8 (33.9–37.7)	10.1 (8.4–12.2)	39.4 (34.5–44.5)
Ever had depression, % (95% CI)	15.8 (15.2–16.3)	18.0 (17.4–18.7)	12.5 (11.3–13.9)	12.3 (11.1–13.5)	5.2 (4.1–6.7)	24.5 (18.2–32.0)
No health insurance, % (95% CI)	11.7 (11.1–12.3)	7.7 (7.1–8.2)	12.0 (10.4–13.9)	27.6 (25.6–29.8)	6.2 (4.7–8.1)	21.5 (16.8–27.0)
No primary care provider, % (95% CI)	15.1 (14.5–15.7)	12.9 (12.2–13.5)	18.3 (16.7–20.1)	21.7 (20.0–23.5)	12.5 (10.6–14.7)	21.3 (17.6–25.5)
Food insecurity, % (95% CI)[e]	8.6 (8.1 –9.1)	6.1 (5.7–6.6)	15.9 (14.2–17.6)	13.1 (11.7–14.6)	3.8 (2.7–5.4)	22.4 (17.3–28.5)
Unable to pay medical bills, % (95% CI)[f]	13.8 (13.2–14.3)	12.8 (12.1–13.4)	20.7 (19.0–22.5)	15.7 (14.2–17.3)	4.8 (3.5–6.5)	16.1 (11.6–21.9)
Housing subsidized, % (95% CI)[g]	3.4 (3.1–3.7)	1.8 (1.6–2.1)	10.4 (9.1–12.0)	4.2 (3.4–5.2)	3.3 (2.3–4.5)	6.1 (4.4–8.3)
Nonmetropolitan residence, % (95% CI)[h]	14.3 (13.3–15.4)	18.3 (16.9–19.8)	8.3 (5.9–11.4)	5.4 (3.5–8.4)	1.7 (1.0–2.8)	_[i]

[*] CI, confidence interval.

[a] Unweighted frequencies do not sum to overall total because estimates for the racial and ethnic groups “other single and multiple races” are not reported due to small sample sizes (339) but are included in overall estimates.

[b] Some college or technical school includes those who obtained an associate degree.

[c] Other employment status includes students, homemakers, those working but not for pay, and unspecified other.

[d] Chronic conditions include coronary heart disease, high blood pressure, asthma, diabetes, stroke, cancer, and/or chronic obstructive pulmonary disease.

[e] Food insecurity is defined as those families classified as having low food security or very low food security.

[f] Unable to pay medical bills is defined as a “yes” in response to, “In the past 12 months did you/anyone in the family have problems paying or were unable to pay any medical bills? Include bills for doctors, dentists, hospitals, therapists, medication, equipment, nursing home or home care.”

[g] Subsidized housing is defined as a “yes” in response to paying lower rent because the federal, state, or local government is paying part of the cost.

[h] Nonmetropolitan residence is defined according to the 2013 National Center for Health Statistics Urban-Rural Classification Scheme for Counties as counties described as micropolitan and noncore.

[i] Unreliable estimates are suppressed because the absolute CI width is ≥0.30 or the absolute CI width is between 0.05 and 0.30 and the relative CI width is >130%.

Table 2.

Weighted unadjusted prevalence and 95% CI of individuals with arthritis among adults aged ≥18 years by race and ethnicity and selected characteristics: National Health Interview Survey, United States, 2019[*]

Characteristic	Non-Hispanic White (n = 21,915)	Non-Hispanic Black (n = 3,483)	Hispanic (n = 4,152)	Non-Hispanic Asian (n = 1,648)	Non-Hispanic American Indian/Alaska Native (n = 460)
Respondents with arthritis, n	6,328	913	588	168	155
Overall, % (95% CI)	24.9 (24.3–25.7)	20.2 (18.8–21.8)	12.2 (11.1–13.5)	10.4 (8.6–12.5)	29.5 (22.7–37.4)
Age group, % (95% CI)					
18–44 y	7.5 (6.8–8.2)	5.9 (4.7–7.4)	3.5 (2.8–4.5)	2.4 (1.5–4.0)	12.6 (7.0–21.7)
45–64 y	28.3 (27.1–29.6)	27.2 (24.7–29.9)	17.9 (15.3–20.8)	12.2 (9.1–16.3)	36.9 (25.7–49.7)
≥65 y	48.6 (47.2–49.9)	51.0 (46.7–55.3)	43.7 (38.6–48.9)	32.6 (25.6–40.4)	58.2 (48.8–67.0)
Sex, % (95% CI)					
Men	21.3 (20.4–22.3)	17.3 (15.2–19.6)	9.0 (7.6–10.5)	11.6 (9.0–14.8)	28.1 (20.2–37.6)
Women	28.4 (27.4–29.4)	22.6 (20.7–24.7)	15.3 (13.6–17.1)	9.3 (7.0–12.3)	30.7 (22.8–39.9)
Education level, % (95% CI)[a]					
Less than high school	35.2 (32.2–38.3)	35.5 (29.7–41.7)	17.7 (15.2–20.7)	27.0 (16.7–40.5)	_[b]
High school graduate or equivalent	28.5 (27.1–29.9)	18.3 (15.8–21.0)	10.0 (8.2–12.0)	11.6 (7.0–18.5)	19.9 (12.3–30.5)
At least some college	25.3 (24.0–26.7)	17.9 (15.7–20.4)	9.7 (8.0–11.6)	9.7 (6.4–14.4)	29.7 (19.9–41.9)
College degree or greater	19.0 (18.0–20.0)	17.3 (14.8–20.1)	9.8 (7.6–12.5)	7.5 (6.0–9.4)	22.8 (15.2–32.8)
Employment status, % (95% CI)[c]					
Employed/self-employed	15.2 (14.5–15.9)	11.1 (9.7–12.7)	6.7 (5.7–7.8)	6.3 (4.6–8.6)	16.0 (10.7–23.2)
Unemployed	14.9 (10.4–20.8)	_[b]	_[b]	_[b]	_[b]
Retired	48.4 (46.9–49.9)	52.3 (48.2–56.4)	45.4 (39.9–50.9)	34.8 (26.8–43.7)	58.2 (44.4–70.9)
Unable to work/disabled	57.0 (53.7–60.2)	42.9 (37.7–48.4)	44.8 (36.8–53.0)	_[b]	_[b]
Other	14.7 (12.5–17.2)	8.5 (5.3–13.4)	6.1 (4.0–9.2)	_[b]	_[b]
Number of chronic conditions, % (95% CI)[d]					
None	12.9 (12.2–13.7)	8.0 (6.7–9.4)	5.2 (4.4–6.2)	5.8 (4.2–8.0)	14.1 (8.3–23.0)
One or two	36.9 (35.7–38.1)	30.1 (27.5–32.9)	23.4 (20.8–26.3)	20.7 (16.1–26.4)	36.5 (27.5–46.6)
Three or more	61.7 (58.6–64.8)	60.6 (54.4–66.4)	53.1 (43.6–62.4)	_[b]	70.1 (54.9–81.8)

Characteristic	Non-Hispanic White (n = 21,915)	Non-Hispanic Black (n = 3,483)	Hispanic (n = 4,152)	Non-Hispanic Asian (n = 1,648)	Non-Hispanic American Indian/Alaska Native (n = 460)
Body mass index level, % (95% CI)					
Normal/underweight (<25 kg/m^2)	18.5 (17.5–19.5)	13.1 (10.8–15.8)	8.8 (6.8–11.3)	8.2 (6.3–10.6)	24.9 (16.7–35.5)
Overweight (25–29.9 kg/m^2)	24.2 (23.1–25.4)	18.9 (16.5–21.6)	12.6 (10.8–14.5)	13.4 (9.8–18.1)	23.4 (15.5–33.7)
Obese (≥30 kg/m^2)	32.6 (31.3–33.9)	25.5 (23.2–28.0)	15.0 (12.8–17.4)	13.5 (7.8–22.5)	36.2 (26.1–47.7)
Ever had depression, % (95% CI)					
Yes	38.1 (36.5–39.9)	43.2 (38.0–48.5)	30.5 (25.9–35.5)	16.9 (9.8–27.5)	47.6 (37.0–58.5)
No	22.0 (21.3–22.8)	17.0 (15.5–18.5)	9.7 (8.6–11.0)	10.0 (8.2–12.2)	23.7 (16.9–32.1)
Health insurance coverage, % (95% CI)					
Yes	25.9 (25.2–26.6)	21.4 (19.8–23.1)	14.9 (13.4–16.5)	10.9 (9.0–13.1)	34.5 (27.3–42.4)
No	14.1 (12.1–16.4)	11.7 (8.5–16.1)	5.4 (4.0–7.3)	_[b]	_[b]
Primary care provider, % (95% CI)					
Yes	26.1 (25.4–26.8)	21.0 (19.3–22.7)	13.8 (12.5–15.4)	10.6 (8.7–12.8)	29.5 (22.6–37.4)
No	17.6 (15.9–19.4)	17.4 (14.2–21.1)	6.5 (4.9–8.5)	_[b]	29.2 (18.8–42.3)
Food insecurity, % (95% CI)[e]					
Yes	39.7 (36.5–42.9)	26.3 (22.3–30.7)	20.2 (15.7–25.7)	_[b]	_[b]
No	24.0 (23.3–24.7)	19.0 (17.4–20.6)	10.8 (9.7–12.0)	9.6 (7.9–11.7)	26.3 (20.4–33.3)
Unable to pay medical bills, % (95% CI)[f]					
Yes	34.2 (32.1–36.3)	28.7 (24.9–32.9)	16.7 (13.2–21.0)	18.4 (10.6–29.9)	41.9 (29.5–55.5)
No	23.6 (22.9–24.4)	18.2 (16.7–19.8)	11.4 (10.3–12.6)	9.8 (8.0–11.9)	26.8 (20.4–34.3)
Housing subsidized, % (95% CI)[g]					
Yes	49.1 (43.7–54.4)	27.6 (23.0–32.8)	31.0 (21.5–42.5)	22.1 (11.3–38.9)	_[b]
No	24.5 (23.8–25.2)	19.2 (17.6–20.8)	11.2 (10.1–12.4)	9.9 (8.0–12.1)	29.0 (22.4–36.6)
Metropolitan classification, % (95% CI)[h]					
Metropolitan	23.7 (22.9–24.5)	19.3 (17.9–20.9)	12.2 (11.0–13.5)	10.5 (8.7–12.6)	33.0 (26.6–40.0)
Nonmetropolitan	30.4 (28.9–31.9)	30.3 (26.1–34.8)	13.0 (9.2–17.9)	_[b]	25.7 (15.9–38.9)

[*] CI, confidence interval.

[a] Some college or technical school includes those who obtained an associate degree.

[b] Unreliable estimates are suppressed because the absolute CI width is ≥0.30 or the absolute CI width is between 0.05 and 0.30 and the relative CI width is >130%.

[c] Other employment status includes students, homemakers, those working but not for pay, and unspecified other.

[d] Chronic conditions include coronary heart disease, high blood pressure, asthma, diabetes, stroke, cancer, and chronic obstructive pulmonary disease.

[e] Food insecurity is defined as those families classified as having low food security or very low food security.

[f] Unable to pay medical bills is defined as a "yes" response to "In the past 12 months did you/anyone in the family have problems paying or were unable to pay any medical bills? Include bills for doctors, dentists, hospitals, therapists, medication, equipment, nursing home or home care."

[g] Subsidized housing is defined as a "yes" response to paying lower rent because the federal, state, or local government is paying part of the cost.

[h] Nonmetropolitan residence is defined according to the 2013 National Center for Health Statistics Urban-Rural Classification Scheme for Counties as counties described as micropolitan and noncore.

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Table 3.

Weighted unadjusted and adjusted prevalence and 95% CI of individuals with arthritis among adults aged ≥18 years and those with severe joint pain who received health care provider counseling for physical activity among adults with arthritis by race and ethnicity, National Health Interview Survey, United States, 2019*

Estimates from selected logistic regression models	Non-Hispanic White	Non-Hispanic Black	Hispanic	Non-Hispanic Asian	Non-Hispanic American Indian/Alaska Native
Arthritis					
Respondents, n	21,915	3,483	4,152	1,648	460
Unadjusted, % (95% CI)	24.9 (24.3–25.7)	20.2 (18.8–21.8)	12.2 (11.1–13.5)	10.4 (8.6–12.5)	29.5 (22.7–37.4)
PR	1.0 (referent)	0.81 (0.75–0.88)	0.49 (0.44–0.54)	0.42 (0.35–0.50)	1.18 (0.92–1.52)
Age adjusted, % (95% CI)	22.9 (22.3–23.6)	22.3 (20.8–23.7)	16.0 (14.6–17.4)	11.8 (10.0–13.9)	30.3 (23.7–37.7)
PR	1.0 (referent)	0.97 (0.91–1.04)	0.70 (0.64–0.76)	0.51 (0.44–0.61)	1.32 (1.05–1.67)
Adjusted in partial multivariable model, % (95% CI)[a]	23.0 (22.3–23.7)	19.1 (17.9–20.4)	15.7 (14.3–17.1)	16.1 (13.7–18.9)	24.5 (19.3–30.6)
PR	1.0 (referent)	0.83 (0.78–0.89)	0.68 (0.62–0.75)	0.70 (0.60–0.82)	1.07 (0.85–1.35)
Adjusted in full multivariable model, % (95% CI)[b]	23.1 (22.4–23.8)	18.7 (17.5–20.0)	15.5 (14.2–16.9)	15.9 (13.4–18.6)	23.8 (18.7–29.6)
PR	1.0 (referent)	0.81 (0.76–0.87)	0.67 (0.61–0.73)	0.69 (0.58–0.81)	1.03 (0.81–1.30)
Severe joint pain					
Sample with arthritis, n	6,328	913	588	168	155
Unadjusted, % (95% CI)	22.5 (21.2–23.9)	36.6 (33.2–40.2)	35.5 (30.9–40.5)	16.7 (10.8–24.9)	39.1 (30.2–48.7)
PR	1.0 (referent)	1.63 (1.46–1.82)	1.58 (1.36–1.83)	0.74 (0.48–1.14)	1.74 (1.36–2.22)
Age adjusted, % (95% CI)	22.5 (21.2–23.9)	36.4 (32.9–40.0)	35.7 (31.0–40.7)	16.7 (10.8–24.9)	39.1 (30.2–48.7)
PR	1.0 (referent)	1.59 (1.42–1.78)	1.55 (1.34–1.80)	0.74 (0.48–1.14)	1.70 (1.32–2.18)
Adjusted in partial multivariable mode, % (95% CI)[a]	23.3 (21.9–24.8)	32.4 (29.3–35.6)	30.3 (25.8–35.1)	24.0 (16.4–33.8)	30.5 (23.0–39.2)
PR	1.0 (referent)	1.39 (1.24–1.56)	1.30 (1.10–1.53)	1.03 (0.71–1.49)	1.31 (1.00–1.72)
Adjusted in full multivariable model, % (95% CI)[b]	23.5 (22.2–25.0)	31.0 (27.9–34.2)	30.3 (25.9–35.2)	25.4 (17.8–34.8)	29.6 (21.9–38.6)
PR	1.0 (referent)	1.31 (1.17–1.48)	1.29 (1.09–1.52)	1.08 (0.77–1.51)	1.26 (0.94–1.68)
Health care provider counseling for physical activity					
Sample with arthritis, n	6,328	913	588	168	155
Unadjusted, % (95% CI)	52.2 (50.5–53.8)	58.9 (54.8–62.8)	55.3 (50.4–60.1)	51.0 (40.7–61.1)	58.0 (48.1–67.4)
PR	1.0 (referent)	1.13 (1.05–1.21)	1.06 (0.97–1.16)	0.98 (0.79–1.20)	1.11 (0.94–1.32)
Age adjusted, % (95% CI)	52.1 (50.5–53.8)	58.9 (54.8–62.9)	55.5 (50.7–60.3)	51.0 (40.7–61.1)	58.0 (48.1–67.4)

Estimates from selected logistic regression models	Non-Hispanic White	Non-Hispanic Black	Hispanic	Non-Hispanic Asian	Non-Hispanic American Indian/Alaska Native
PR	1.0 (referent)	1.13 (1.05–1.21)	1.06 (0.97–1.16)	0.98 (0.80–1.20)	1.11 (0.94–1.32)
Adjusted in partial multivariable model, % (95% CI)[a]	51.7 (49.9–53.5)	57.5 (53.4–61.5)	57.6 (53.0–62.2)	59.2 (49.6–68.1)	58.0 (48.3–67.2)
PR	1.0 (referent)	1.11 (1.03–1.20)	1.11 (1.02–1.21)	1.14 (0.97–1.34)	1.12 (0.95–1.33)
Adjusted in full multivariable model, % (95% CI)[b]	51.8 (50.1–53.6)	57.6 (53.5–61.6)	57.8 (53.2–62.3)	59.0 (49.6–67.8)	58.2 (49.1–66.8)
PR	1.0 (referent)	1.11 (1.03–1.20)	1.12 (1.02–1.21)	1.14 (0.97–1.33)	1.12 (0.96–1.31)

*Logistic regression models are complete patient analyses, and observations with missing data are excluded. BMI, body mass index; CI, confidence interval; PR, prevalence ratio.

[a]Prevalence (%), PR, and 95% CI for each race and ethnic group were obtained from multivariable logistic regression models that also included age, sex, education level, employment status, BMI level, depression history, and number of chronic conditions.

[b]Prevalence (%), PR, and 95% CI for each race and ethnic group were obtained from multivariable logistic regression models that also included age, sex, education level, employment status, BMI level, depression history, number of chronic conditions, inability to pay medical bills, and food insecurity.