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Repetitive Strain Injuries in Adults in the Past 3 Months: United States, 2021

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Abstract

Objective—This report describes the percentage of adults aged 18 and over who reported injuries from repetitive strain in the past 3 months by selected sociodemographic characteristics, including age, sex, race and Hispanic origin, and family income. The impacts of these injuries—limitation of usual activity for at least 24 hours and whether a medical professional was consulted for the injuries—are also examined.

Methods—Data from the 2021 National Health Interview Survey were used to estimate the percentage of adults who had repetitive strain injuries in the past 3 months by sociodemographic characteristics. Among those who had a repetitive strain injury in the past 3 months, 24-hour limitation of activity and consultation of a medical professional are also examined by sociodemographic characteristics.

Results—In 2021, for adults aged 18 and over in the United States, 9.0% had repetitive strain injuries in the past 3 months. Adults aged 35–49 (10.3%) and 50–64 (11.6%), White non-Hispanic adults (subsequently, White; 9.5%), and adults with family income at 400% or more of the federal poverty level (9.8%) tended to have higher percentages. For those who had repetitive strain injuries, 44.2% limited their activities for at least 24 hours, with the highest percentages among White adults (47.0%), women (47.1%), and adults with a family income less than 200% of the federal poverty level (51.0%). For those who limited their activity for at least 24 hours due to a repetitive strain injury, 51.4% consulted a doctor or medical professional, with the highest percentages among women (56.3%) and Black non-Hispanic adults (66.2%).

Keywords: pain • musculoskeletal injuries • repetitive motion injury • repetitive stress injury • National Health Interview Survey (NHIS)

Introduction

Repetitive strain injuries, sometimes called repetitive motion or repetitive stress injuries, are injuries that result from the same movement or force over an extended period of time. Such injuries can develop from both recreational activities, such as sports, exercising, or hobbies, as well as occupational (or work-related) activities, such as typing, lifting, and conducting tasks that require a repetitive motion (1). Broadly, these injuries can affect tendons, muscles, nerves, and joints, resulting in pain and limited mobility. They can include conditions such as carpal tunnel syndrome, tennis elbow, and tendonitis (1–3). These conditions can be a source of pain and may require treatment ranging from physical therapy to surgery (4). Depending on the type of injury, repetitive strain injuries may be permanent or temporary and can result in several health consequences including pain, numbness, and a limitation or loss of mobility. Many sources of repetitive strain injuries can be prevented or avoided depending on the activity, for example, by stretching and muscle training, ergonomic modifications, and maintaining appropriate body form when conducting repeated tasks or activities (5–8).

Previous studies of repetitive strain injuries have typically focused on their prevalence during specific tasks or activities, within certain industries or occupations, or on the examination of specific types of repetitive strain injuries. Using the 2021 National Health Interview Survey (NHIS), this report describes the percentage of adults aged 18 and over who reported a repetitive strain injury in the past 3 months by sociodemographic characteristics. This report also provides detail on the impacts of repetitive strain injuries, including the percentage of

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adults with 24-hour limitation of activity in the past 3 months, as well as those who both limited their activities for at least 24 hours and sought medical advice.

Methods

Data source

Data from the 2021 NHIS were used to examine repetitive strain injuries. NHIS is a nationally representative household survey of the U.S. civilian noninstitutionalized population, providing annually collected information on health status, health-related behaviors, and healthcare access and use. The estimates in this report are based on data from the Sample Adult module of the 2021 NHIS, which is administered to a randomly selected adult from each household sampled (9). Estimates in this report are weighted to account for the complex survey design.

Due to the impacts of the COVID-19 pandemic, NHIS interviews were attempted by telephone from January through April 2021 (9), and in-person visits were conducted to follow up on nonresponse, deliver recruitment materials, or conduct interviews when telephone numbers were unknown. From May through December 2021, initial contact and interviews with selected cases were generally performed in person, with follow-up contact and interviews conducted by telephone only if necessary. Depending on local COVID-19 conditions, interviewers were given the flexibility to initially contact households by telephone if needed. In 2021, 62.8% of the Sample Adult interviews were conducted at least partially by telephone (9). The overall NHIS Sample Adult response rate was 50.9%.

Repetitive strain injuries

Information on repetitive strain injuries was collected through a series of survey questions. Introductory language was read before the first question: "The first question is about repetitive strain injuries. By this, we mean injuries caused by repeating the same movement over an extended period. Examples include carpal tunnel syndrome, tennis elbow, or tendonitis." Three variables were examined: 1) the percentage of adults who experienced a repetitive strain injury in the past 3 months (asked of all respondents), 2) the percentage of adults with a repetitive strain injury who limited their usual activities for at least a day, and 3) the percentage of adults with activity-limiting repetitive strain injuries who sought medical advice or care.

Respondents were considered to have had a repetitive strain injury if they responded yes to having experienced any injuries due to a repetitive strain during the past 3 months. Note that respondents who answered yes to this question may have experienced more than one repetitive strain injury during the past 3 months.

Adults who responded yes to experiencing such an injury in the past 3 months were then asked if any of their injuries were serious enough to limit their usual activities for at least 24 hours. If the respondent answered yes, they were considered to have had activity-limiting repetitive strain injuries in the past 3 months.

Adults who responded yes to limiting their usual activity for at least 24 hours due to a repetitive strain injury were asked if they talked to or saw "a doctor or other health professional" about any of these injuries. If the respondent answered yes, they were considered to have had activity-limiting repetitive strain injuries in the past 3 months that needed medical advice or care.

Selected sociodemographic characteristics

Sociodemographic measures included age group (18–34, 35–49, 50–64, and 65 and over), sex, race and Hispanic origin, and family income as a percentage of the federal poverty level (FPL).

Race and Hispanic origin—Respondents were grouped into four categories: Asian non-Hispanic (subsequently, Asian), Black or African American non-Hispanic (subsequently, Black), White non-Hispanic (subsequently, White), or Hispanic or Latino. These categories were based on responses to two survey questions asking about race and Hispanic or Latino origin, where those characterized as Hispanic or Latino could be of any race or combination of races. People who reported unknown race or ethnicity or multiple races were not reported due to small sample size but were included in the overall analysis and other sociodemographic subanalyses.

Family income—Based on the combined income for all people within a household who were related by blood, marriage or cohabitation, or adoption during the past calendar year. For this analysis, family income was categorized based on the ratio of family income to the FPL set by the U.S. Census Bureau based on the family's size (10), and grouped into three categories: less than 200%, 200% to less than 400%, and 400% or more. Family income was calculated using NHIS imputed income files (11).

Statistical analysis

Percentages are presented for the three survey questions on repetitive strain injuries, and 95% confidence intervals are generated using the Korn–Graubard method for complex surveys. Estimates are calculated using NHIS survey weights and are representative of the U.S. civilian noninstitutionalized population.

Percentages and their corresponding variances were calculated using SAS-callable SUDAAN version 11.0.3 software (RTI International, Research Triangle Park, N.C.) within SAS version 9.4 software (SAS Institute Inc., Cary, N.C.). All procedures account for the stratified, complex cluster sampling design of NHIS.

Respondents with missing data or unknown information are excluded unless specifically noted. All percentages reported in this analysis meet National Center for Health Statistics standards of reliability (12). Differences in percentages between sociodemographic subgroup characteristics were evaluated using two-sided significance tests at the $p < 0.05$ level. Trends by family income (as a percentage of FPL) and age group were evaluated using orthogonal polynomials in logistic regression. Terms such as "more likely" and "less likely" indicate a statistically significant difference. Lack of comment regarding the difference between any two estimates does not necessarily mean that the difference was tested and not found to be significant.

Results

Repetitive strain injuries in the past 3 months

Overall, 9.0% of adults reported having repetitive strain injuries in the past 3 months in 2021 (Figure 1, Table 1). Men and women were similar in their reports of injuries due to repetitive strain (9.1% and 9.0%, respectively). Although not statistically significant, percentages varied by age group, from 7.3% among young adults aged 18–34 to 10.3% among adults aged 35–49 and 11.6% among those aged 50–64. The percentage for adults aged 65 and over was 7.0%.

The percentage of adults who had repetitive strain injuries was significantly different between Asian (7.5%) and White (9.5%) adults but not significantly different between White and Black adults (8.6%) (Figure 2, Table 1). Although both White and Black adults tended to have higher percentages compared with Hispanic or Latino (7.3%) and Asian (7.5%) adults, these differences were not significant compared with those for Black adults.

Adults living in households with higher family incomes were more likely to have repetitive strain injuries. Adults with a family income that was 400% or more FPL reported the highest percentage of having a repetitive strain injury (9.8%) compared with lower income groups (8.5% among adults at 200% to less than 400% FPL, and 8.4% among those at less than 200% FPL).

Limitation of usual activities following serious repetitive strain injuries

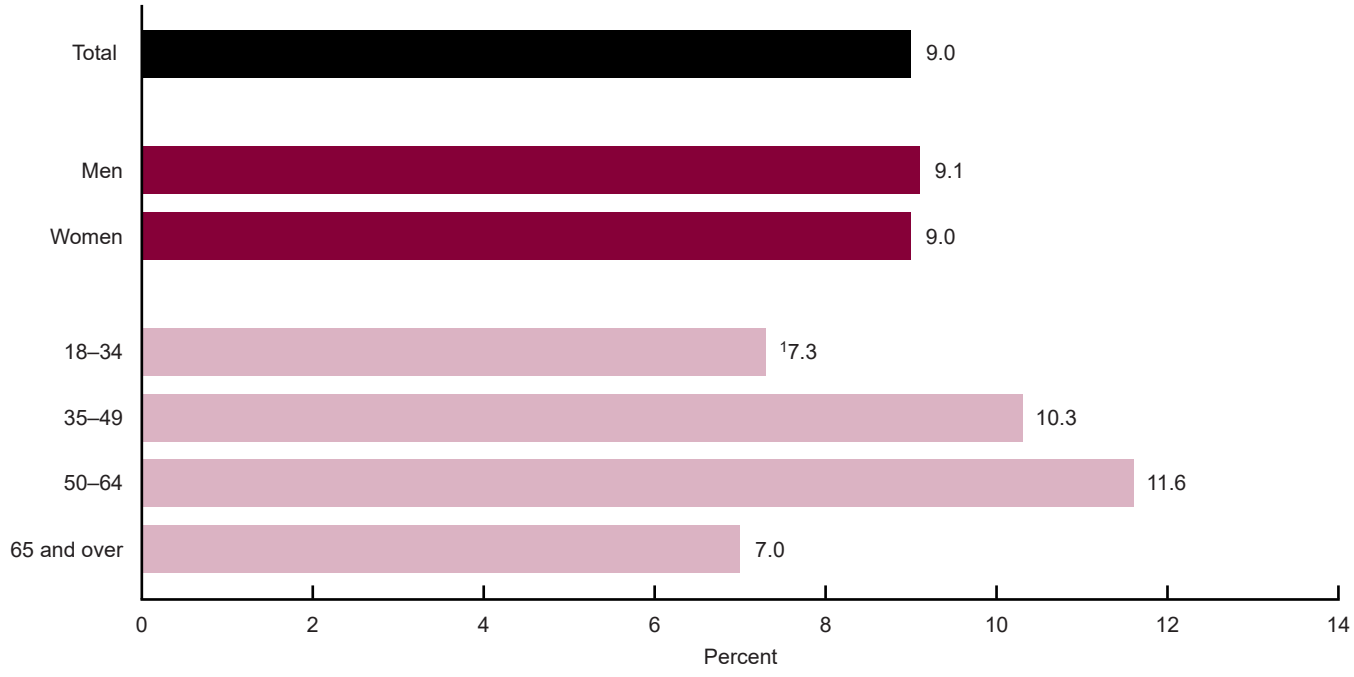
In 2021, 44.2% of adults who had repetitive strain injuries in the past 3 months reported that their injuries were serious enough to limit their activities for at least 24 hours (Figure 3, Table 2). Women were more likely to have limited their activities for at least 24 hours (47.1%) than men (41.1%). Adults aged 50–64 were more likely to limit their activities for at least 24 hours (47.8%) than those aged 35–49 (40.0%) and 65 and over (41.5%) with repetitive strain injuries. Those aged 18–34 also tended to report a higher percentage of activity limitation (46.1%), but the differences were not significant.

White adults with repetitive strain injuries were more likely to limit their activities for 24 hours (47.0%) compared with other races and Hispanic-origin groups (Figure 4, Table 2). Asian adults had lower rates (27.3%) than White (47.0%) and Hispanic or Latino (39.6%) adults. Asian adults also had lower rates than Black adults (36.0%), although the difference was not significant. Adults with family incomes of less than 200% FPL were more likely to limit their activities following a repetitive strain injury (51.0%) compared with those having family incomes of 200% to less than 400% FPL (41.3%) and 400% or more FPL (42.2%).

Seeking medical advice or care for activity-limiting repetitive strain injuries

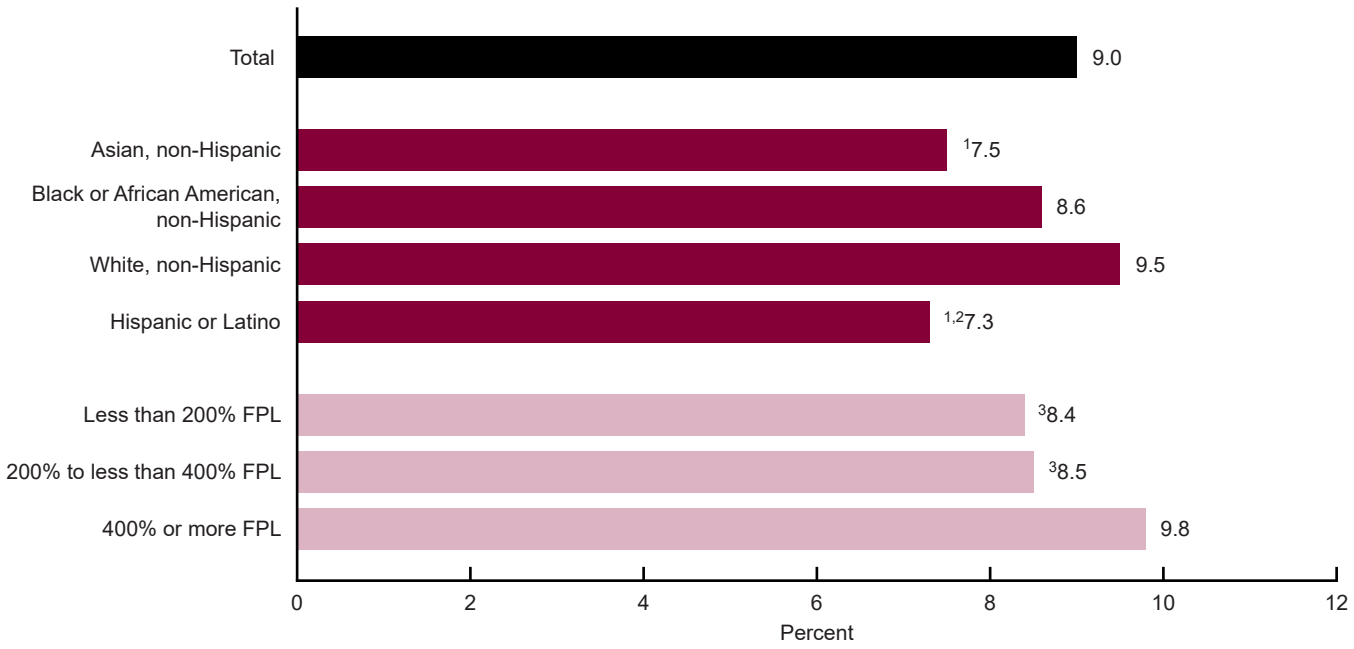
Among adults with activity-limiting repetitive strain injuries, 51.4% sought medical care by consulting a doctor or health professional (Figure 5, Table 3). Men were less likely to seek medical

Figure 1. Percentage of adults aged 18 and over with repetitive strain injuries in the past 3 months, by sex and age group: United States, 2021



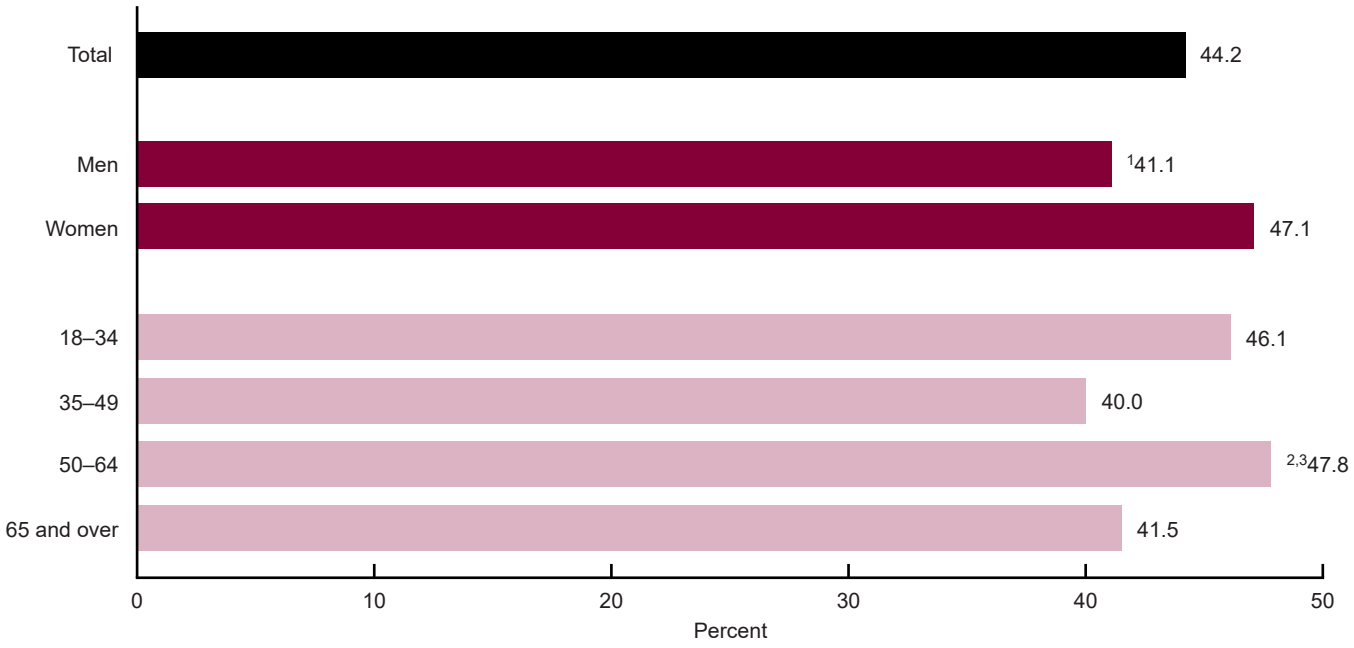
[1]Significant quadratic trend by age ($p < 0.05$).
NOTES: Results are based on a positive response to the survey question, "During the past 3 months, did you have any injuries due to repetitive strain?" Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.
SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

Figure 2. Percentage of adults aged 18 and over with repetitive strain injuries in the past 3 months, by race, Hispanic origin, and family income: United States, 2021



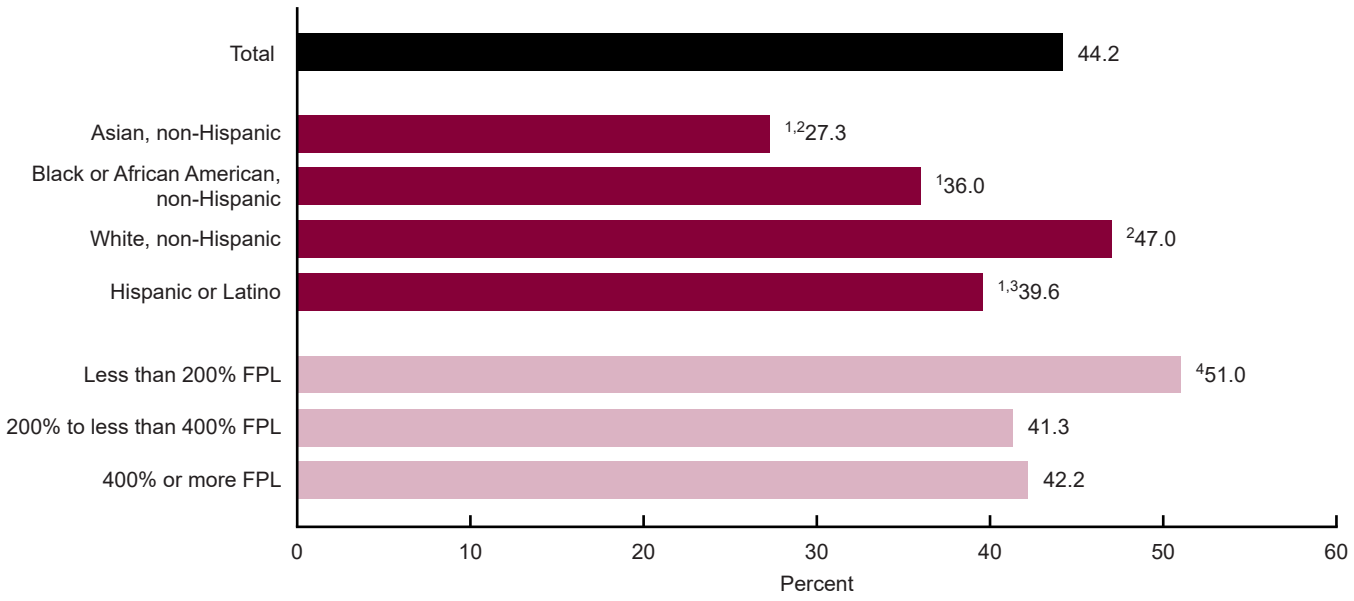
[1]Significantly different from White non-Hispanic adults ($p < 0.05$).
[2]People of Hispanic origin may be of any race.
[3]Significantly different from 400% or more FPL ($p < 0.05$).
NOTES: Results are based on a positive response to the survey question, "During the past 3 months, did you have any injuries due to repetitive strain?" Adults categorized as Asian non-Hispanic, Black non-Hispanic, or White non-Hispanic indicated one race only. FPL is federal poverty level, which is based on the ratio of the family's income in the previous calendar year to the appropriate poverty threshold defined by the U.S. Census Bureau. Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.
SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

Figure 3. Percentage of adults aged 18 and over with repetitive strain injuries in the past 3 months who limited their activities for at least 24 hours, by sex and age group: United States, 2021



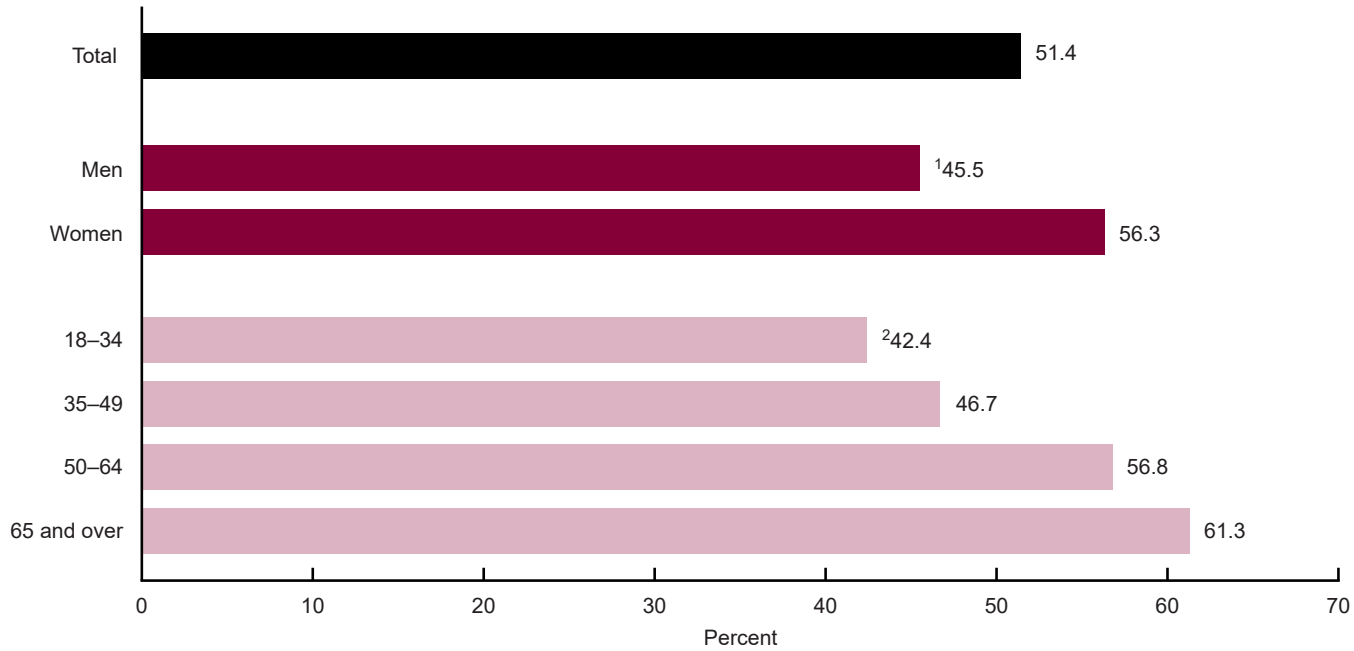
[1]Significantly different from women ($p < 0.05$).
[2]Significantly different from adults aged 35–49 ($p < 0.05$).
[3]Significantly different from adults aged 65 and over ($p < 0.05$).
NOTES: Results are based on positive responses to two survey questions: "During the past 3 months, did you have any injuries due to repetitive strain?" and "Were any repetitive strain injuries serious enough to limit your usual activities for at least 24 hours?" Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.
SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

Figure 4. Percentage of adults aged 18 and over with repetitive strain injuries in the past 3 months who limited their activities for at least 24 hours, by race, Hispanic origin, and family income: United States, 2021



[1]Significantly different from White non-Hispanic adults ($p < 0.05$).
[2]Significantly different from Hispanic or Latino adults ($p < 0.05$).
[3]People of Hispanic origin may be of any race.
[4]Significantly different from other income groups ($p < 0.05$).
NOTES: Results are based on positive responses to two survey questions: "During the past 3 months, did you have any injuries due to repetitive strain?" and "Were any repetitive strain injuries serious enough to limit your usual activities for at least 24 hours?" Adults categorized as Asian non-Hispanic, Black non-Hispanic, or White non-Hispanic indicated one race only. FPL is federal poverty level, which is based on the ratio of the family's income in the previous calendar year to the appropriate poverty threshold defined by the U.S. Census Bureau. Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.
SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

Figure 5. Percentage of adults aged 18 and over who consulted a medical professional for repetitive strain injuries in the past 3 months that limited their activities for at least 24 hours, by sex and age group: United States, 2021



[1]Significantly different from women ($p < 0.05$).
[2]Significant linear trend by age ($p < 0.05$).
NOTES: Results are based on positive responses to three survey questions: "During the past 3 months, did you have any injuries due to repetitive strain?"; "Were any repetitive strain injuries serious enough to limit your usual activities for at least 24 hours?"; and "During the past 3 months, did you talk to or see a doctor or other health professional about your repetitive strain injuries?" Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.
SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

care for activity-limiting repetitive strain injuries (45.5%) than women (56.3%). Younger adults aged 18–34 and 35–49 were less likely to consult with a medical professional (42.4% and 46.7%, respectively) for their repetitive strain injuries than adults in older age groups (56.8% of adults aged 50–64 and 61.3% of those aged 65 and over).

Black adults with an activity-limiting repetitive strain injury were more likely to consult a doctor or health professional (66.2%) compared with White (50.9%) and Hispanic or Latino (49.3%) adults (Figure 6, Table 3). Percentages of adults consulting a doctor or health professional were not significantly different based on family income.

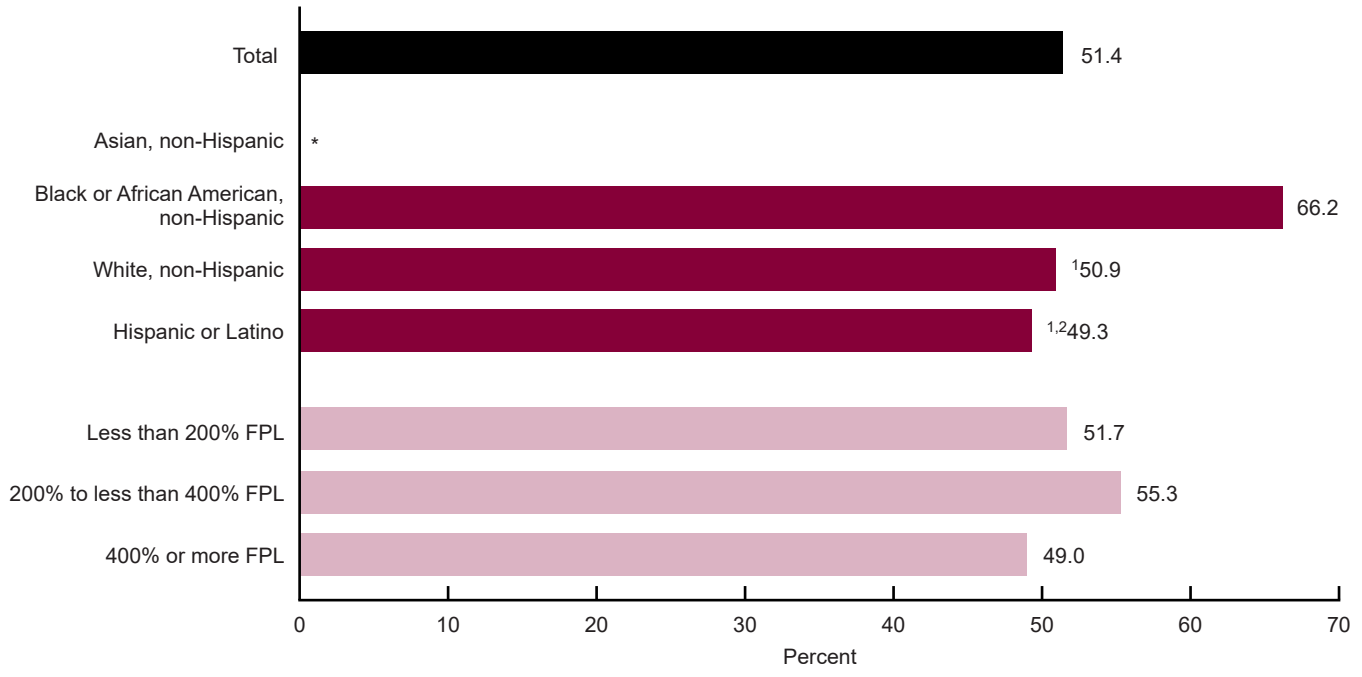
Discussion

This report estimates the percentage of U.S. adults who reported having repetitive strain injuries in the past 3 months, and the impact of these injuries including the limitation of usual activities and seeking medical care or advice. In 2021, 9.0% of adults experienced repetitive strain injuries in the past 3 months, with almost one-half of those respondents indicating their injuries were serious enough to limit their activities for 24 hours (44.2%). Further, of the 44.2% who were limited in their activities, just over one-half consulted a doctor or medical professional (51.4%).

Although the percentages of men and women reporting repetitive strain injuries were similar, women were more likely to experience injuries that limited their activities and more likely to consult a medical professional as a result. Middle-aged adults (aged 35–49 and 50–64) were most likely to have repetitive strain injuries compared with younger adults aged 18–34 and older adults aged 65 and over. Limitation of activities among adults who had repetitive strain injuries varied by age group. However, consulting with a medical professional was more common among older age groups, with adults 65 and over reporting the highest percentages of seeking medical advice or care. White adults had higher percentages of repetitive strain injuries and were most likely to limit their daily activities. However, among those who had to limit daily activities because of an injury, Black adults were most likely to consult a medical professional. Those with higher family incomes were more likely to have repetitive strain injuries, but those with lower family incomes were more likely to have limited their activities following a repetitive strain injury. However, no significant difference was found in seeking medical advice or care based on family income.

Repetitive strain injuries are an overarching term for a wide array of specific conditions, which can stem from a variety of causes. While this analysis considers all repetitive strain injuries, note that each condition and cause may impact different demographic subgroups disproportionately. For example, recreational activities more

Figure 6. Percentage of adults aged 18 and over who consulted a medical professional for repetitive strain injuries in the past 3 months that limited their activities for at least 24 hours, by race, Hispanic origin, and family income: United States, 2021



* Percentage does not meet National Center for Health Statistics standards of reliability.
[1]Significantly different from Black or African American non-Hispanic adults ($p < 0.05$).
[2]People of Hispanic origin may be of any race.
NOTES: Results are based on positive responses to three survey questions: "During the past 3 months, did you have any injuries due to repetitive strain?"; "Were any repetitive strain injuries serious enough to limit your usual activities for at least 24 hours?"; and "During the past 3 months, did you talk to or see a doctor or other health professional about your repetitive strain injuries?" Adults categorized as Asian non-Hispanic, Black non-Hispanic, or White non-Hispanic indicated one race only. FPL is federal poverty level, which is based on the ratio of the family's income in the previous calendar year to the appropriate poverty threshold defined by the U.S. Census Bureau. Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.
SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

often undertaken by certain groups could increase the risk of repetitive strain injuries (6). Workplace activities can also be a risk factor—jobs requiring extensive physical labor with repetitive motions and awkward movement angles, as well as more sedentary office jobs with prolonged exposure to poor ergonomics and rigid repetitive movements, can result in relevant conditions.

Limitations

This report has several limitations. Responses to survey questions on repetitive strain injuries were all based on self-report. Although an interview prompt defines what are considered repetitive strain injuries and provides examples, respondents may misreport or not report a repetitive strain injury. Regarding medical consultation for repetitive strain injuries, the question asks if respondents talked to or saw "a doctor or other health professional" for their injury. Affirmative responses to this may have a variety of meanings including requiring surgery, visiting a doctor, consulting a work-based first-aid station, or discussing the issue with a clinician by phone. Additionally, to limit recall bias, respondents were limited to discussing repetitive strain injuries for the past 3 months, and, as a result, percentages presented here should not be compared with estimates of annual prevalence. Lastly, although all findings reported in this analysis meet National Center for Health Statistics standards of reliability, due to the subset (nested) nature of the follow-up questions on activity limitation and seeking medical advice, the ability (power) to detect significant differences between selected sociodemographic subgroups was limited by sample size (12).

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Table 1. Percentage of adults aged 18 and over who reported a repetitive strain injury in the past 3 months, by sex, age group, race and Hispanic origin, and family income: United States, 2021

Selected characteristic	Percent (95% confidence interval)
Total	9.0 (8.6, 9.5)
Sex	
Men	9.1 (8.5, 9.7)
Women	9.0 (8.4, 9.6)
Age group	
18–34	7.3 (6.6, 8.2)
35–49	10.3 (9.5, 11.2)
50–64	11.6 (10.7, 12.5)
65 and over	7.0 (6.4, 7.6)
Race and Hispanic origin	
Asian, non-Hispanic	7.5 (6.1, 9.0)
Black or African American, non-Hispanic	8.6 (7.2, 10.1)
White, non-Hispanic	9.5 (9.0, 10.0)
Hispanic or Latino	7.3 (6.3, 8.4)
Family income level	
Less than 200% FPL	8.4 (7.6, 9.2)
200% to less than 400% FPL	8.5 (7.7, 9.3)
400% or more FPL	9.8 (9.2, 10.4)

NOTES: Data are based on a positive response to the survey question, "During the past 3 months, did you have any injuries due to repetitive strain?" Adults categorized as Hispanic may be of any race or combination of races. Adults categorized as Asian non-Hispanic, Black non-Hispanic, or White non-Hispanic indicated one race only. FPL is federal poverty level, which is based on the ratio of the family's income in the previous calendar year to the appropriate poverty threshold defined by the U.S. Census Bureau. Confidence intervals are calculated using the Korn–Graubard method for complex surveys. Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.

SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

Table 2. Percentage of adults aged 18 and over with a repetitive strain injury in the past 3 months who reported limiting their activities for at least 24 hours, by sex, age group, race and Hispanic origin, and family income: United States, 2021

Selected characteristic	Percent (95% confidence interval)
Total	44.2 (41.8, 46.6)
Sex	
Men	41.1 (38.0, 44.3)
Women	47.1 (43.7, 50.4)
Age group	
18–34	46.1 (40.6, 51.6)
35–49	40.0 (35.9, 44.3)
50–64	47.8 (44.0, 51.7)
65 and over	41.5 (37.1, 45.9)
Race and Hispanic origin	
Asian, non-Hispanic	27.3 (19.1, 36.7)
Black or African American, non-Hispanic	36.0 (28.3, 44.3)
White, non-Hispanic	47.0 (44.3, 49.7)
Hispanic or Latino	39.6 (33.1, 46.5)
Family income level	
Less than 200% FPL	51.0 (45.7, 56.2)
200% to less than 400% FPL	41.3 (36.9, 45.8)
400% or more FPL	42.2 (38.9, 45.5)

NOTES: Data are based on positive responses to two survey questions: "During the past 3 months, did you have any injuries due to repetitive strain?" and "Were any repetitive strain injuries serious enough to limit your usual activities for at least 24 hours?" Adults categorized as Hispanic may be of any race or combination of races. Adults categorized as Asian non-Hispanic, Black non-Hispanic, or White non-Hispanic indicated one race only. FPL is federal poverty level, which is based on the ratio of the family's income in the previous calendar year to the appropriate poverty threshold defined by the U.S. Census Bureau. Confidence intervals are calculated using the Korn–Graubard method for complex surveys. Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.

SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

Table 3. Percentage of adults aged 18 and over with a repetitive strain injury in the past 3 months who reported limiting their activities for at least 24 hours and seeing a doctor or medical professional, by sex, age group, race and Hispanic origin, and family income: United States, 2021

Selected characteristic	Percent (95% confidence interval)
Total	51.4 (48.1, 54.7)
Sex	
Men	45.5 (40.4, 50.7)
Women	56.3 (51.8, 60.7)
Age group	
18–34	42.4 (34.6, 50.5)
35–49	46.7 (40.2, 53.3)
50–64	56.8 (51.3, 62.2)
65 and over	61.3 (54.4, 67.8)
Race and Hispanic origin	
Asian, non-Hispanic	*
Black or African American, non-Hispanic	66.2 (56.0, 75.4)
White, non-Hispanic	50.9 (46.9, 54.9)
Hispanic or Latino	49.3 (38.4, 60.2)
Family income level	
Less than 200% FPL	51.7 (45.2, 58.2)
200% to less than 400% FPL	55.3 (48.0, 62.4)
400% or more FPL	49.0 (44.1, 53.9)

* Estimate does not meet National Center for Health Statistics standards of reliability.

NOTES: Data are based on positive responses to three survey questions: "During the past 3 months, did you have any injuries due to repetitive strain?"; "Were any repetitive strain injuries serious enough to limit your usual activities for at least 24 hours?"; and "During the past 3 months, did you talk to or see a doctor or other health professional about your repetitive strain injuries?" Adults categorized as Hispanic may be of any race or combination of races. Adults categorized as Asian non-Hispanic, Black non-Hispanic, or White non-Hispanic indicated one race only. FPL is federal poverty level, which is based on the ratio of the family's income in the previous calendar year to the appropriate poverty threshold defined by the U.S. Census Bureau. Confidence intervals are calculated using the Korn–Graubard method for complex surveys. Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population.

SOURCE: National Center for Health Statistics, National Health Interview Survey, 2021.

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