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Pain management and social functioning limitations among adults with chronic pain by diabetes status: National Health Interview Survey, United States, 2019 – 2020

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Abstract

Aims: This study aims to describe pain management technique usage and social functioning limitations among adults with chronic pain by diabetes status.

Methods: The 2019 and 2020 National Health Interview Survey data were pooled to complete this analysis. Use of the following techniques in the past 3 months were measured: 1) prescription opioids; 2) physical, rehabilitative, or occupational therapy; 3) talk therapies; 4) chiropractic care; 5) yoga, Tai Chi, or Qi Gong; 6) massage; and 7) relaxation techniques. The social functioning limitations assessed were: 1) doing errands alone; 2) participating in social activities; and 3) work limitations. Weighted prevalence and 95% confidence intervals (CIs) were estimated for each outcome by diabetes status. Logistic regression was used to estimate age- and sex-adjusted odds ratios (aORs) to assess differences by diabetes status.

Results: Adults with diabetes and chronic pain were more likely to use prescription opioids (aOR: 1.4; 95% CI: 1.2, 1.6) but less likely to use various nonpharmacological techniques than those without diabetes. Additionally, adults with diabetes and chronic pain were more likely to report each social functioning limitation than those without diabetes.

Conclusions: Results suggest adults with diabetes and chronic pain may be missing beneficial opportunities to manage pain.

Keywords

diabetes; chronic pain; social functioning limitations; pain management

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Ethics statement: This research was based on deidentified, public-use data files; therefore, institutional review board approval was not required for this study.

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Introduction

Chronic pain, defined as pain that persists or recurs for more than 3 months [1], is a complex condition that can arise through different mechanisms (e.g., nerve damage, tissue injury, etc.) [2, 3]. It is a common condition in the United States, affecting approximately 51.6 million (20.9%) U.S. adults in 2021 [4]. This debilitating condition has been found to disproportionately affect certain populations such as females, older adults, and adults with a history of specific chronic diseases, including diabetes [4]. Additionally, research demonstrates that individuals living with chronic pain are more likely to experience sleep disorders [5], anxiety and depression [6], suicidality [7], and several other negative health outcomes [8]. It is also costly in the United States, with costs estimated between \$560-\$635 billion per year in 2010 [9].

Chronic pain affected nearly 38% of U.S. adults with diabetes in 2021 [4]. This high frequency reflects the pathophysiology of diabetes complications, including diabetic neuropathic pain [10–12] and other sources of pain (e.g., relating to musculoskeletal conditions) [13–16]. The high occurrence of chronic pain among U.S. adults with diabetes highlights an opportunity for improving pain management for a large segment of this population, which in turn may improve diabetes self-management [17] and quality of life for numerous adults with diabetes [18].

The Centers for Disease Control and Prevention's 2022 Clinical Practice Guideline for Prescribing Opioids for Pain recommends maximizing nonpharmacological pain management techniques (e.g., physical therapy, cognitive behavioral therapy [CBT], certain complementary therapies, etc.) and nonopioid pharmacologic therapies as appropriate for the specific condition and patient among adults with chronic pain [19]. This recommendation is supported by evidence that various nonpharmacological pain management techniques can improve pain and function without risk of serious harms [20]. The recent American Academy of Neurology (AAN) recommendations for treating painful diabetic polyneuropathy also state that pain management techniques such as CBT, exercise, Tai Chi, and mindfulness may be offered to individuals who prefer nonpharmacological approaches [21]. Both recommendations reinforce the potential benefits that nonpharmacological approaches may provide adults suffering from chronic pain, including pain associated with diabetes complications.

Recent studies have characterized the use of different pain management techniques among U.S. adults with chronic pain [22–24]. While previous studies have described prescription pain medication use patterns among individuals with diabetes [25–27], recent data have not been used to assess the utilization of nonpharmacological pain management techniques from a nationally representative sample of U.S. adults with diabetes and chronic pain. Thus, the objective of the current study is to describe select pain management technique usage among U.S. adults experiencing chronic pain by diabetes status and the association of the co-occurrence of these two conditions with social functioning limitations.

Methods

Study design

National Health Interview Survey (NHIS) data from 2019 and 2020 were pooled to complete this study. The 2019 and 2020 NHIS have been described in detail previously [28, 29]. In brief, the NHIS is an ongoing, household-based survey designed to assess the health of noninstitutionalized civilians in the United States. The NHIS uses a probability sampling design composed of geographic clusters to capture a nationally representative sample of U.S. households and noninstitutional group quarters. Data are predominately collected via face-to-face interviews; however, due to the COVID-19 pandemic, approximately 70.7% of the 2020 Sample Adult interviews were conducted at least partially by telephone (compared to 34.3% of the 2019 Sample Adult interviews conducted at least partially by telephone) [28, 29]. The NHIS Sample Adult interview was completed by 31,997 adults aged 18 years or older in 2019 (response rate: 59.1%); a total of 31,568 adults participated in 2020, composed of 21,153 adults from the original 2020 sample (response rate: 48.9%) and 10,415 adults from the 2019 sample who were reinterviewed (response rate: 29.6%). However, to avoid having individuals represented more than once, the reinterviewed sample was excluded from the current study, leaving a total of 53,150 adults.

Measures

Chronic pain and diabetes definitions—Self-reported data captured during the Sample Adult interviews were used to characterize the analytic sample of the present study (i.e., adults with chronic pain and their respective diabetes status). Similar to previous epidemiological research [4, 22], individuals who responded “most days” or “every day” to the question, “In the past 3 months, how often did you have pain? Would you say never, some days, most days, or every day?” were defined as having chronic pain. Diabetes status was determined by an affirmative response to the question “Has a doctor or other health professional ever told you that you had diabetes?”.

Outcome measures – pain management techniques and social functioning limitations—During the 2019 and 2020 Sample Adult interviews, participants reported their use of select pain management techniques in the past 3 months. However, for the primary analysis of the current study, only pain management techniques assessed during both the 2019 and 2020 Sample Adult interview were evaluated. Thus, use of the following pain management techniques in the past 3 months were measured: 1) prescription opioids (overall and for a chronic pain indication); 2) physical, rehabilitative, or occupational therapy; 3) talk therapies such as CBT; 4) spinal manipulation or other forms of chiropractic care; 5) yoga, Tai Chi, or Qi Gong (note: the practice of “Qi Gong” was added to this question in 2020); 6) massage; and 7) meditation, guided imagery, or other relaxation techniques.

Additionally, during both survey years, participants described if a physical, mental, or emotional problem limited their ability to participate in select social functioning activities. The three social functioning limitation measures assessed in the current study were: 1) doing errands alone; 2) participating in social activities; and 3) work limitations. When asked

about doing errands alone and participating in social activities, adults who reported “a lot of difficulty” or “cannot do at all” were considered as being limited. Adults who responded “yes” to the survey question “Are you limited in the kind or amount of work you can do because of a physical, mental or emotional problem?” were defined as having a work-related limitation.

Sociodemographic and additional characteristics—Sociodemographic characteristics included sex (male, female), age (18 – 44, 45 – 64, ≥65 years), race and ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, other), educational attainment (no high school or general educational development [GED], high school or GED, some college, Bachelor’s degree or higher), marital status (married, widowed, divorced or separated, never married, living with partner), family income (<100%, 100% – <200%, 200% – <400%, ≥ 400% federal poverty level [FPL]), rural-urban classification (large central metro, large fringe metro, medium and small metro, nonmetropolitan), and Census Bureau region (Northeast, Midwest, South, West). Family income was imputed when missing and reported as a percentage of the FPL based on annual weighted average thresholds published by the Census Bureau [30]. A separate indicator of pain intensity based on the question “Thinking about the last time you had pain, how much pain did you have? Would you say a little, a lot, or somewhere in between?” was also analyzed as a descriptive measure.

Statistical analyses

Weighted prevalence and 95% confidence intervals (CIs) were estimated for each pain management technique and social functioning limitation outcome by diabetes status. Rao-Scott chi-square tests were conducted to test differences in sociodemographic characteristics by diabetes status. Unadjusted and multivariable logistic regression models were used to estimate odds ratios (OR) to determine if pain management techniques and social functioning limitations differed between adults with and without diabetes experiencing chronic pain. Multivariable models included adjustment for age and sex. To account for the pooling of 2019 and 2020 data, the annual sampling weights were handled as suggested by the National Center for Health Statistics [29]. All statistical analyses used a significance level of 0.05 and were conducted using SAS (version 9.4; SAS Institute Inc., Cary, North Carolina) survey procedures to account for the complex survey design of the NHIS.

Supplemental analyses

Select pain management questions appeared exclusively in the 2019 or 2020 survey. In 2019, this included questions about the use of 1) a self-management program or workshop and 2) chronic pain support groups. In 2020, this included questions about the use of 1) prescribed pain relievers other than opioids; 2) over-the counter medications; and 3) exercise for pain. As a supplementary analysis, use of these select pain management techniques were assessed for their survey year by diabetes status. Since data were not pooled for this supplementary analysis, adults from 2019 sample who were reinterviewed in 2020 (N = 10,415) were not excluded from the 2020 sample; thus, the 2019 and 2020 samples included a total of 31,997 and 31,568 adults, respectively. Similar statistical approaches were employed to compare

use of these additional pain management techniques by diabetes status; however, the original 2019 and 2020 annual sampling weights were used for this supplementary analysis.

Results

Sociodemographic characteristics

Of the 53,150 adults available for analysis, a total of 12,124 (21.2%) adults reported having chronic pain in the past 3 months. After excluding adults with missing diabetes status data (N = 9), 12,115 adults remained in the final analytic sample including 2,236 (17.3%) with diabetes and 9,879 (82.7%) without diabetes. The sociodemographic characteristics of the sample are presented in Table 1 by diabetes status. Among adults with chronic pain, those with diabetes were older, less likely to identify as non-Hispanic White, and had lower educational attainment and family incomes. A higher proportion of adults with than without diabetes were widowed, divorced or separated, and living in the South and nonmetropolitan areas. Pain intensity also differed by diabetes status, with more frequent reporting of “a lot” of pain among adults with diabetes during their most recent pain event (40.5% vs. 31.3%) (Table 1).

Pain management techniques

The use of the select pain management techniques among adults with chronic pain are reported by diabetes status in Table 2. After adjusting for age and sex, adults with diabetes and chronic pain had higher odds of reporting use of a prescription opioid in the past 3 months (aOR: 1.4; 95% CI: 1.2, 1.6), including use of prescription opioids for a chronic pain indication (aOR: 1.4; 95% CI: 1.2, 1.7), than individuals without diabetes. Conversely, adults with diabetes were less likely to report use of yoga/Tai Chi/Qi Gong (aOR: 0.4; 95% CI: 0.3, 0.5), chiropractic care (aOR: 0.8; 95% CI: 0.6, 0.9), massage for pain (aOR: 0.8; 95% CI: 0.7, 1.0), and relaxation techniques such as meditation and guided imagery (aOR: 0.8; 95% CI: 0.7, 1.0). Reported use of physical, rehabilitative, or occupational therapy and talk therapies for chronic pain management did not differ by diabetes status (Table 2).

Social functioning limitations

Age- and sex-adjusted differences were observed between adults with or without diabetes for each of the analyzed social functioning limitations (Table 3). Adults with diabetes and chronic pain were more likely to report having a work-related limitation (aOR: 2.0; 95% CI: 1.8, 2.3), difficulty doing errands alone (aOR: 2.0; 95% CI: 1.7, 2.4), and difficulty participating in social activities (aOR: 1.9; 95% CI: 1.6, 2.3) when compared to those without diabetes.

Supplemental analyses

Among the 2019 and 2020 annual samples, 7,184 (20.5%) and 7,422 (21.8%) adults reported experiencing chronic pain, respectively. After excluding individuals with missing diabetes status data (2019: N = 5; 2020: N = 7), a total of 7,179 (diabetes: N = 1,342 [17.9%]; no diabetes: N = 5,837 [82.1%]) and 7,415 (diabetes: N = 1,338 [17.1%]; no diabetes: N = 6,077 [82.9%]) adults were available for analysis in 2019 and 2020, respectively. The characteristics of adults with chronic pain in 2019 and 2020 are presented

by diabetes status in Table S1 and Table S2. Table S3 reports the use of select pain management techniques measured exclusively in either 2019 or 2020 by year and diabetes status. Among the 2019 respondents with chronic pain, no differences were observed by diabetes status in the use of self-management programs or workshops for pain (aOR: 1.1; 95% CI: 0.8, 1.5). However, in 2020, adults with diabetes were less likely to use exercise for pain (aOR: 0.7; 95% CI: 0.6, 0.8) and more likely to use prescription pain relievers other than opioids (aOR: 1.4; 95% CI: 1.2, 1.6) than those without diabetes. No differences were observed in the use of over-the-counter medications between these two groups in 2020 (aOR: 0.9; 95% CI: 0.8, 1.1) (Table S3).

Discussion

In the current study, key differences were observed between adults with and without diabetes experiencing chronic pain. First, these two groups differed across a variety of sociodemographic characteristics. Further, adults with diabetes and chronic pain were more likely to report using select pharmacological pain management techniques, but less likely to utilize several different nonpharmacological techniques. Lastly, social functioning limitations were found to be more common among adults experiencing both diabetes and chronic pain. These findings provide valuable public health insights and help better contextualize the common intersection between chronic pain and diabetes.

Findings from the current study align with existing research indicating that prescription pain medication use is more common among individuals with diabetes than individuals without diabetes [25, 27]. For example, a recent study using 2005 to 2018 National Health and Nutrition Examination Survey data observed that adults with diabetes were twice as likely to be prescribed pain medications, including opioids, than adults without diabetes [27]. In the present study, the greater use of nonopioid prescription pain relievers among adults with diabetes experiencing chronic pain may be related to the use of AAN recommended medications for painful diabetic neuropathy (e.g., gabapentinoids, serotonin-norepinephrine reuptake inhibitors, etc.) [21, 31]. While the AAN does not recommend opioids be used to treat painful diabetic neuropathy [21], the higher use of opioids among adults with diabetes experiencing chronic pain may have been due to poor tolerance and failure of AAN recommended medications [21, 31, 32] and the greater reporting of intense pain among adults with diabetes in the present study. However, it is also important to consider that the observed results may also be related to additional comorbidities among adults with diabetes, as noted by a recent study that assessed opioid prescriptions among Medicare beneficiaries by diabetes status [25].

The lower utilization of several nonpharmacological pain management techniques among adults with diabetes and chronic pain is a noteworthy finding of the current study. Evidence suggests that modalities that are recommended for diabetes management, such as exercise, yoga, and Tai Chi [33], may also be beneficial for pain [34–38]. For example, significant reductions in pain interference and musculoskeletal pain have been observed from exercise-based interventions among adults with diabetes [36, 38]. Additionally, while no difference in talk therapy and peer support group use was observed between adults with and without diabetes experiencing chronic pain, the low prevalence of use observed in the present study

is disconcerting since these techniques have been found to improve pain outcomes among people living with diabetes [39, 40]. Overall, results from the present study indicate that adults with diabetes and chronic pain may be missing beneficial opportunities to manage their pain.

Although nonpharmacological approaches are not associated with risks similar to those of opioid therapies (e.g., opioid use disorder and overdose) [19, 20], research suggests access and insurance coverage may play a role in how adults choose to manage their pain [41, 42]. In a study among Medicare beneficiaries experiencing persistent musculoskeletal pain, results demonstrated that availability of select nonpharmacological approaches lowered the odds of an older adult filling an opioid prescription [42]. Other research has highlighted limitations in insurance coverage of different nonpharmacological pain management techniques [41]. Given the sociodemographic differences observed in the present study, it is possible that the reported use of select pain management techniques may be related to barriers that commonly affect disadvantaged populations with higher diabetes prevalence [43]. Thus, increased access to nonpharmacological approaches, including low-cost options, may help increase utilization among adults with diabetes experiencing chronic pain.

The current study also detected differences in several social functioning limitations using a recent, nationally representative sample of U.S. adults with chronic pain. Diabetes and chronic pain have previously been shown to be independently linked with limitations and disabilities [23, 44, 45]; however, the present study further illustrates the excess limitations experienced among adults with diabetes living with chronic pain. These results stress the need for improved pain management amongst this population and increased public health awareness of the debilitating joint effect of diabetes and chronic pain. Moreover, these results also suggest the potential need for increased attention around the psychological well-being of adults with diabetes experiencing chronic pain given the common ties between these conditions, limited sociability, and adverse mental health outcomes [46–50].

This study has limitations that should be considered. First, all measured outcomes were self-reported and subject to recall and social desirability bias. Additionally, due to low prevalence of select outcomes, additional covariates (e.g., race/ethnicity, education, etc.) could not be incorporated into the adjustment set (i.e., age and sex) because doing so would have caused statistical positivity violations; thus, the observed results may be subject to uncontrolled confounding bias. Sample size constraints limited assessments of effect measure modification by key sociodemographic factors as well. It is also important to note that disruptions associated with the COVID-19 pandemic may have affected health care access and social functioning activities in 2020, with potential for differential impacts by diabetes status. The data are also cross-sectional and hence cannot be used to establish causal relationships. Lastly, the response rate decreased notably during the 2020 interviews and the potential for non-response bias should be considered.

Conclusions

The present study describes the use of pain management techniques and social functioning limitations among adults with chronic pain by diabetes status. The results demonstrate that

adults with diabetes and chronic pain are more likely to utilize pharmacological approaches to combat chronic pain, but less likely to use several different nonpharmacological approaches, than those without diabetes experiencing chronic pain. Moreover, social functioning limitations were found to be more common among adults with diabetes and chronic pain than adults without diabetes who have chronic pain. Low utilization of various nonpharmacological techniques and excess social functioning limitations suggest that adults with diabetes and chronic pain may be missing beneficial opportunities to manage chronic pain and that improved pain management would be advantageous in this population. While further research may be beneficial, the results from the present study provide public health considerations since improved pain management among adults with diabetes experiencing chronic pain may help limit pain-related competing demands that could be interfering with diabetes management.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Characteristics of adults with chronic pain by diabetes status: National Health Interview Survey, United States, 2019–2020^{a,b}

Characteristic	Diabetes (N = 2,236)			No diabetes (N = 9,879)			p
	N	%	95% CI	N	%	95% CI	
Sex							0.33
Male	1,002	46.2	43.5, 48.9	4,238	44.7	43.4, 46.1	
Female	1,233	53.8	51.1, 56.5	5,640	55.3	53.9, 56.6	
Age (years)							<0.01
18–44	142	9.0	7.2, 10.7	2,320	30.9	29.4, 32.5	
45–64	879	42.5	39.9, 45.0	3,857	40.7	39.4, 42.1	
≥65	1,215	48.6	46.0, 51.1	3,689	28.3	27.2, 29.5	
Race/Ethnicity ^c							<0.01
White, non-Hispanic	1,506	64.2	61.0, 67.3	7,686	73.8	72.1, 75.6	
Black, non-Hispanic	346	15.8	13.5, 18.1	921	10.0	9.0, 11.0	
Hispanic	255	14.0	11.4, 16.6	803	10.7	9.3, 12.0	
Other	129	6.0	4.5, 7.6	469	5.5	4.7, 6.3	
Education							<0.01
No high school diploma or GED	383	20.9	18.1, 23.6	1,022	14.1	12.8, 15.4	
High school diploma or GED	690	32.4	29.7, 35.0	2,791	30.5	29.2, 31.8	
Some college	752	33.2	30.6, 35.8	3,266	33.5	32.1, 34.8	
Bachelor's degree or higher	394	13.6	12.1, 15.2	2,748	21.9	20.8, 23.0	
Marital status							<0.01
Married	889	49.7	47.1, 52.4	4,339	52.2	50.8, 53.6	
Widowed	439	15.8	13.8, 17.8	1,287	8.4	7.8, 9.0	
Divorced or separated	519	18.0	16.0, 19.9	1,976	14.2	13.4, 15.1	
Never married	254	10.1	8.5, 11.7	1,502	15.8	14.6, 17.0	
Living with partner	106	6.4	5.0, 7.8	644	9.3	8.5, 10.1	
Family income ^d							<0.01
<100% FPL	475	20.0	17.7, 22.3	1,433	13.8	12.8, 14.9	
100% to <200% FPL	603	26.0	23.7, 28.4	2,073	21.3	20.2, 22.5	
200 to <400% FPL	643	31.4	28.9, 33.8	2,997	31.3	30.1, 32.5	
≥400% FPL	515	22.6	20.4, 24.8	3,376	33.5	32.1, 34.9	
Urban-rural classification							0.02
Large central metro	560	24.9	21.8, 28.1	2,321	24.7	22.4, 27.0	
Large fringe metro	411	20.6	17.6, 23.6	2,169	22.8	20.3, 25.4	
Medium and small metro	754	32.4	28.6, 36.2	3,470	34.0	30.7, 37.3	
Nonmetropolitan	511	22.1	19.2, 24.9	1,919	18.5	16.7, 20.2	
U.S. Census Bureau region							<0.01
Northeast	331	14.2	12.4, 16.1	1,629	16.5	14.9, 18.1	
Midwest	523	22.3	19.7, 25.0	2,423	23.9	22.0, 25.8	
South	938	45.2	42.1, 48.3	3,421	36.4	34.3, 38.6	

Characteristic	Diabetes (N = 2,236)			No diabetes (N = 9,879)			<i>p</i>
	N	%	95% CI	N	%	95% CI	
West	444	18.2	15.7, 20.7	2,406	23.1	21.1, 25.2	<0.01
Pain intensity ^e							
A little	327	13.7	11.9, 15.4	1,914	18.9	17.8, 19.9	
Between a little and a lot	979	45.9	43.0, 48.8	4,866	49.9	48.5, 51.2	
A lot	924	40.5	37.6, 43.3	3,082	31.3	30.0, 32.6	

Abbreviations: CI = confidence interval; GED = general educational development certificate; FPL = federal poverty level.

Sample sizes (N) are unweighted. Percentages (%) and associated 95% CIs are weighted. Missing values were excluded (i.e., complete case analysis). Boldface indicates statistical significance (i.e., Rao-Scott chi-square $p < 0.05$).

^a. Chronic pain is based on responses of “most days” or “every day” to the survey question, “In the past 3 months, how often did you have pain? Would you say never, some days, most days, or every day?”

^b. Diabetes is based on a positive response (i.e., “yes”) to the survey question, “Has a doctor or other health professional ever told you that you had diabetes?” Respondents were asked not to include prediabetes or gestational diabetes.

^c. “Other” category is composed of individuals who identified as non-Hispanic Asian, non-Hispanic American Indian/Alaska Native, other single race, or multiple races.

^d. Family income was imputed when missing. Family income was reported as a percentage of the FPL based on annual weighted average thresholds published by the U.S. Census Bureau (<https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>).

^e. Based on the survey question “Thinking about the last time you had pain, how much pain did you have? Would you say a little, a lot, or somewhere in between?”

Use of select pain management techniques during the past 3 months among adults with chronic pain by diabetes status: National Health Interview Survey, United States, 2019–2020^{a,b}

Table 2.

Pain management technique	Diabetes (N = 2,236)			No diabetes (N = 9,879)			OR (95% CI)	
	N	%	95% CI	N	%	95% CI	Unadjusted	Adjusted ^c
Prescription opioids	582	26.5	24.1, 28.9	1,984	19.3	18.3, 20.4	1.5 (1.3, 1.7)	1.4 (1.2, 1.6)
Prescription opioids for chronic pain indication	439	19.7	17.5, 21.9	1,372	13.2	12.2, 14.1	1.6 (1.4, 1.9)	1.4 (1.2, 1.7)
Physical, rehabilitative, or occupational therapy	438	18.3	16.3, 20.4	1,944	17.9	16.9, 18.9	1.0 (0.9, 1.2)	1.0 (0.8, 1.1)
Talk therapies such as cognitive behavioral therapy	49	2.2	1.5, 2.9	351	3.4	2.9, 3.9	0.6 (0.4, 0.9)	0.8 (0.6, 1.2)
Spinal manipulation or other forms of chiropractic care	194	8.4	6.9, 9.9	1,229	12.1	11.2, 13.0	0.7 (0.5, 0.8)	0.8 (0.6, 0.9)
Yoga, Tai Chi, or Qi Gong ^d	84	3.1	2.4, 3.8	989	9.5	8.7, 10.2	0.3 (0.2, 0.4)	0.4 (0.3, 0.5)
Massage	281	13.8	11.9, 15.6	1,823	19.0	17.8, 20.1	0.7 (0.6, 0.8)	0.8 (0.7, 1.0)
Meditation, guided imagery, or other relaxation techniques	281	12.2	10.4, 14.0	1,718	16.6	15.6, 17.7	0.7 (0.6, 0.8)	0.8 (0.7, 1.0)

Abbreviations: CI = confidence interval; OR = odds ratio.

Sample sizes (N) are unweighted. Prevalence (%) and associated 95% CIs are weighted. Missing values were excluded (i.e., complete case analysis). Boldface indicates statistical significance (p < 0.05). Referent group is adults without diabetes.

^a Chronic pain is based on responses of “most days” or “every day” to the survey question, “In the past 3 months, how often did you have pain? Would you say never, some days, most days, or every day?”

^b Diabetes is based on a positive response (i.e., “yes”) to the survey question, “Has a doctor or other health professional ever told you that you had diabetes?” Respondents were asked not to include prediabetes or gestational diabetes.

^c Adjusted for age and sex.

^d In 2020, the practice of “Qi Gong” was added to yoga and Tai Chi on this question.

Table 3.

Social functioning limitations reported among adults with chronic pain by diabetes status: National Health Interview Survey, United States, 2019–2020^{a,b}

Social functioning limitation	Diabetes (N = 2,236)			No diabetes (N = 9,879)			OR (95% CI)	
	N	%	95% CI	N	%	95% CI	Unadjusted	Adjusted ^c
Difficulty doing errands alone ^d	381	17.7	15.6, 19.8	877	8.4	7.6, 9.1	2.4 (2.0, 2.8)	2.0 (1.7, 2.4)
Difficulty participating in social activities ^e	371	17.3	15.1, 19.4	946	9.6	8.8, 10.4	2.0 (1.7, 2.3)	1.9 (1.6, 2.3)
Work limitation ^f	1,416	63.4	60.8, 65.9	4,439	42.6	41.1, 44.0	2.3 (2.1, 2.6)	2.0 (1.8, 2.3)

Abbreviations: CI = confidence interval; OR = odds ratio.

Sample sizes (N) are unweighted. Prevalence (%) and associated 95% CIs are weighted. Missing values were excluded (i.e., complete case analysis). Boldface indicates statistical significance (p <0.05). Referent group is adults without diabetes.

^aChronic pain is based on responses of “most days” or “every day” to the survey question, “In the past 3 months, how often did you have pain? Would you say never, some days, most days, or every day?”

^bDiabetes is based on a positive response (i.e., “yes”) to the survey question, “Has a doctor or other health professional ever told you that you had diabetes?” Respondents were asked not to include prediabetes or gestational diabetes.

^cAdjusted for age and sex.

^dDifficulty in doing errands alone is based on responses of “a lot of difficulty” or “cannot do at all” to the survey question, “Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor’s office or shopping?”

^eDifficulty participating in social activities is based on responses of “a lot of difficulty” or “cannot do at all” to the survey question, “Because of a physical, mental, or emotional condition, do you have difficulty participating in social activities such as visiting friends, attending clubs and meetings, or going to parties?”

^fWork limitation is based on a positive response (i.e., “yes”) to the survey question, “Are you limited in the kind or amount of work you can do because of a physical, mental or emotional problem?”