

# Psychological well-being among US adults with arthritis and the unmet need for mental health care

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**Purpose:** Mental health conditions can increase the risk of disability among adults with arthritis. The objective of this analysis was to compare the prevalence of serious psychological distress (SPD), depression, and anxiety among US adults with arthritis vs. those without; characterize adults with arthritis with and without SPD; and determine correlates of seeing a mental health professional during the year for adults with arthritis and SPD.

**Materials and methods:** Cross-sectional analysis of adults in the 2011–2013 National Health Interview Survey.

**Results:** Higher proportions of adults with arthritis had SPD (6.8% vs. 2.4%), depression (19.4% vs. 7.3%), and anxiety (29.3% vs. 16.3%) compared to those without. Of the estimated 3.5 million adults with arthritis and SPD, only 39% saw a mental health professional during the year. Adjusted analyses identified the following statistically significant relationships: those who were older (45–64 and  $\geq 65$  [vs. 18–44], prevalence ratio [PR]=0.8 and 0.4, respectively), less educated (PR=0.5 and 0.7 for high school or less vs. college degree, respectively), and without health insurance coverage (vs. any private, PR=0.7), were less likely to see a mental health professional, whereas the disabled or unemployed (vs. employed, PR=1.6 and 1.5, respectively), and those unable to afford mental health care throughout the year (PR=1.3) were more likely.

**Conclusion:** The high prevalence of SPD, anxiety, and depression in adults with arthritis suggests the need for increased mental health screening, with subsequent referral to mental health professionals or other treatment programs, in that population.

**Keywords:** serious psychological distress, anxiety, depression, access to mental health care, rheumatoid arthritis

## Introduction

The prevalence of mental health conditions such as depression, anxiety, and serious psychological distress (SPD; a nonspecific indicator of mental health problems) is higher among adults with arthritis compared to the general population.<sup>1–3</sup> In individuals with arthritis, mental health issues interact with other health conditions and functional states (e.g., pain, fatigue, and disability<sup>4–9</sup>) such that deterioration in one area can directly or indirectly affect the others. Mental health comorbidities in individuals with chronic diseases can exacerbate disability,<sup>10,11</sup> interfere with disease management,<sup>12,13</sup> and increase disease severity and mortality.<sup>14,15</sup> Providing adequate mental health care for these populations is, therefore, an important strategy for improving overall wellbeing. The benefits of doing so have been documented: treating depression can improve medication adherence for chronic conditions,<sup>16</sup> and interventions to treat mental health issues among individuals with arthritis improve both psychological and physical outcomes.<sup>17–20</sup>

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Access to and use of mental health care services is a challenging public health issue for the US population, where significant unmet need in the treatment of mental health disorders exists. Analysis of data from a nationally representative face-to-face household survey of adults (the World Health Organization's National Comorbidity Survey, carried out in 2001–2003) found ~60% of US adults with psychological problems did not receive any form of mental health care service in the previous year.<sup>21</sup> Among the arthritis population specifically, a survey of older osteoarthritis patients with depressed mood assessed prospectively between 1996 and 1998 found that a little less than half received no mental health care,<sup>22</sup> and the Arthritis Conditions Health Effects Survey reported that only 50% of participants with anxiety and/or depression sought care for their condition.<sup>23</sup> Gaps in mental health treatment likely result from multiple factors; frequently cited barriers to receiving mental health care include financial issues, insurance coverage limits,<sup>24,25</sup> and attitudinal obstacles.<sup>26</sup>

The arthritis literature concerning mental health in this population has been focused on elderly and middle age persons, specifically the prevalence and predictors of mental health conditions,<sup>1,2,23</sup> and impacts of comorbid mental health conditions on outcomes.<sup>14,15</sup> To our knowledge, no studies concerning access to mental health care services in the US arthritis population have been published in the past 10 years. In order to treat mental health conditions effectively and reduce relapse in this population, analyses that include younger adults and identify correlates of barriers to mental health care services are needed. To address these gaps, we used data from the 2011 to 2013 National Health Interview Survey (NHIS) to accomplish the following objectives: 1) estimate the prevalence of SPD, depression, and anxiety among US adults with arthritis compared to those without arthritis; 2) among adults with arthritis, characterize individuals with and without SPD and assess the proportion that saw a mental health professional in the past year; and 3) among the subset of adults with both arthritis and SPD, determine characteristics associated with seeing a mental health professional in the past year.

## Materials and methods

### Data source

The NHIS is an annual, cross-sectional, in-person household survey that uses a multistage, complex sampling design to generate health-status estimates representative of the US civilian noninstitutionalized population.<sup>27</sup> NHIS survey data are deidentified and publicly available through the Centers for

Disease Control and Prevention's (CDC) website. US Census Bureau interviewers collect data on sociodemographic characteristics, health status, health insurance, and health care utilization for each individual in the household. The sample adult core, which includes measurement of chronic diseases such as arthritis, mental health conditions, and functional and social limitations, is administered to one randomly sampled adult in each household.<sup>28</sup> We combined data for adults  $\geq 18$  years of age in the 2011–2013 sample adult core files to yield a large sample size and stable estimates. The combined file included 102,096 individuals, of which 136 were missing arthritis status. The response rate for the NHIS sample adult module was 81.6% for 2011, 79.7% for 2012, and 81.7% for 2013.<sup>29</sup> Because respondents tend to answer household income questions at a much lower level than other questionnaire items, the National Center for Health Statistics includes an imputed income file with every annual release.<sup>30</sup> We use this file for all analyses including income.

## Analysis variables

### Mental health conditions

Individuals were determined to have SPD using the validated Kessler 6 (K6) scale.<sup>31,32</sup> K6 scores are derived from responses to six questions asking how often in the past 30 days the individual felt “nervous”, “restless”, “hopeless”, “worthless”, “everything feels like an effort”, and “so sad that nothing cheers them up”, with responses ranging from 0 (none of the time) to 4 (all of the time). The responses for these six variables are summed to obtain the K6 score (maximum possible score of 24), and individuals with a score of  $\geq 13$  are considered to have SPD.<sup>31</sup> Information for three other mental health conditions including depression (“Have you ever been told by a doctor or other health professional that you had depression?”) and “During the past 12 months, have you ever had depression?”), anxiety (“During the past 12 months, have you frequently felt anxious, nervous, or worried?”), and stress (“During the past 12 months, have you frequently felt stressed?”) – was collected only in 2012 NHIS.

### Arthritis, other chronic conditions, and other health characteristics

Arthritis status was determined by the question, “Have you ever been told by a doctor or other health professional that you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?” All of the conditions included in this question are characterized by pain and stiffness in and around the joints. The term “arthritis” is used in the public health sphere as a general term for arthritis and other rheumatic

conditions of varying severity that affect the joints and tissues surrounding the joints.<sup>33</sup> Throughout the rest of the paper, “arthritis” is used to describe this group of conditions.

Other chronic conditions were assessed with similar questions. We created a chronic condition count based on the following eight nonarthritis chronic conditions: cancer (except nonmelanoma skin); heart condition (including coronary heart disease, angina, myocardial infarction, or any other heart condition); diabetes; hepatitis or liver condition; hypertension (on at least two different visits); respiratory conditions (current asthma, emphysema, or chronic bronchitis); stroke; and weak or failing kidneys, defined similar to the recommendations of Goodman et al.<sup>34</sup> We also examined respondent-reported general health status (very good/excellent, good, poor/fair), body mass index ( $\text{kg}/\text{m}^2$ ) calculated from self-reported height and weight ( $<25$ ,  $25$  to  $<30$ ,  $\geq 30$ ), and physical activity levels based on the aerobic activity recommendations for adults in the 2008 Physical Activity Guidelines for Americans.<sup>35</sup>

### Sociodemographic characteristics

We examined age (18–44, 45–64,  $\geq 65$ ), sex, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, Asian, other), income-to-poverty ratio, that is, household income as a percentage of federal poverty level ( $<100\%$ ,  $100$  to  $<200\%$ ,  $\geq 200\%$ ) (from the imputed income file),<sup>30</sup> education level (less than high school, high school, some college or associate degree, bachelor’s degree or greater), employment status (employed, retired, disabled, unemployed, volunteer/not in labor force), and marital status (married, widowed, divorced/separated, never married, living with partner).

### Functional and social limitations

We created a functional limitations score by averaging respondent’s ratings of their ability to perform nine activities without special equipment (walk a quarter mile; climb 10 steps; stand for 2 hours; sit for 2 hours; stoop, bend, or kneel; reach overhead; grasp small objects; lift/carry 10 pounds; and push large objects) as per previous work.<sup>36</sup> Responses for each question ranged from “not at all difficult” to “can’t do at all” and were assigned numerical values from 0 to 4, increasing with difficulty. The average score of the responses to all nine activities was grouped as follows to categorize functional limitation: none (0), low ( $>0$  but  $<1$ ), medium ( $>1$  but  $<2$ ), and high ( $\geq 2$ ). We defined social participation restriction as difficulty or inability to shop, go to events, or participate in social activities without special equipment, per previously published analyses.<sup>37</sup>

### Access to care

Variables related to health care access and utilization were health insurance status (any private, public only, not covered), being able to afford mental health counseling in the past year (“During the past 12 months, was there any time when you needed any of the following but didn’t get it because you couldn’t afford it? ...Mental health care or counseling”), and seeing a mental health professional in the past 12 months (“During the past 12 months, have you seen or talked to any of the following health care providers about your own health? ...A mental health professional such as a psychiatrist, psychologist, psychiatric nurse, or clinical social worker”).

### Data analysis

Our initial step was to estimate prevalence proportions and 95% confidence intervals (CIs) of SPD and the other mental health conditions stratified by arthritis status. Then, in the subgroup of adults with arthritis ( $n=24,954$ ), we compared the distribution of all characteristics described above for adults with SPD ( $N=1,762$ ) to adults without (arthritis only,  $n=22,708$ ). In our third step, we investigated correlates of seeing a mental health professional in the past 12 months among adults with arthritis and SPD; that is, among people with arthritis who also had SPD, we estimated associations of the above variables with seeing a mental health professional in the past 12 months.

To develop multivariable logistic regression models predicting the likelihood of seeing a mental health professional in the past 12 months, we first examined univariate logistic regressions for each potential independent variable separately. *P*-values were calculated using the Wald chi-square test. Because age, sex, race, and education affect health care utilization, they were entered in all multivariable models and were retained in the final model regardless of statistical significance. All other variables with unadjusted associations (prevalence ratios [PRs]) that were significant at the  $\alpha=0.05$  level were considered for inclusion in a final multivariable model. We screened for multicollinearity among all variables by examining Pearson correlations to identify pairs of independent variables that were more highly correlated with each other than the outcome. In each case, the variable most highly correlated with the outcome (seeing mental health professional in the past year) was chosen for inclusion in the final multivariable model. Because insurance status could modify someone’s ability to afford mental health care in the past year, we also evaluated the interaction between these two variables in the final model.

We applied sampling weights to all analyses in order to create nationally representative estimates. We estimated PRs and 95% CIs using logistic regression models in SUDAAN 11.0 (Research Triangle Park, NC, USA);<sup>38</sup> all other analyses were executed using SAS 9.4 SURVEY procedures (Cary, NC, USA)<sup>39</sup> with Taylor series linearization to account for the NHIS complex sampling design. Observations with missing values were excluded from analyses; however, information from excluded observations was included in variance calculations using the missing at random assumption.<sup>40</sup>

## Results

Table 1 reports the prevalence of SPD and other mental health conditions among adults with and without arthritis. Prevalence of SPD in the past 30 days was almost threefold higher in adults with arthritis compared to those without (6.8% vs. 2.4%). Prevalence proportions for depression (19.4% vs. 7.3%), anxiety (29.3% vs. 16.3%), and stress (38.0% vs. 26.4%) in the past 12 months were also substantially higher for the arthritis population. Among those with arthritis who reported frequent anxiety, 86% also reported frequent stress, and 67% of those reporting frequent stress also reported frequent anxiety (data not shown). The prevalence of adults with arthritis and SPD in the past 30 days in 2011–2013 NHIS was 3.5 million; annual prevalence of depression and frequent anxiety for adults with arthritis in 2012 was 10.0 and 15.2 million, respectively.

Overall, adults with arthritis and SPD were more socially disadvantaged, with more comorbidity and limitation than adults with arthritis only (Table 2). Specifically, statistically significantly higher proportions of those with SPD had less than a high school education (30.0% vs. 14.5%), low

income-to-poverty ratio (36.0% vs. 11.5%), work disability (54.1% vs. 13.1%), and ≥3 comorbid conditions (35.8% vs. 17.7%) compared to their counterparts without SPD. In addition, the subset with SPD was less than half as likely to meet the US recommended physical activity guidelines for adults (17.5% vs. 39.6%), about three times more likely to report poor/fair health (72.1% vs. 25.5%), had a high level of functional limitations (53.9% vs. 15.5%), and were over four times as likely to experience social participation restriction (38.6% vs. 8.9%). The majority of adults with SPD also reported depression, frequent anxiety, and stress in the past 12 months, with proportions that ranged from three to five times higher than those of without SPD (77.2% vs. 15.5%, 89.7% vs. 25.1%, and 93.1% vs. 34.3%, respectively). Those with SPD were more likely to have no health insurance (17.4% vs. 7.9%) and to report not being able to afford mental health care in the past 12 months compared to those without SPD (22.2% vs. 2.2%). Among the group who report having no health insurance (17.4%), a little less than half also report not being able to afford mental health care (data not shown). This group (no health insurance and cannot afford mental health care) comprises 8.2% of the population with arthritis and SPD.

Table 3 reports unadjusted and adjusted associations with seeing a mental health professional in the past year for adults with arthritis and SPD. (PRs >1 indicate increased prevalence of seeing a mental health professional for the level of the characteristic compared to the reference level, whereas PRs <1 demonstrate a decreased prevalence.)

In unadjusted analyses, groups most likely to have seen a mental health professional in the past year were: those who were unable to work due to disability or unemployed (vs. employed), never having married or were divorced/separated

**Table 1** Prevalence of mental health conditions among adults with and without arthritis, NHIS 2011–2013

Characteristics	Arthritis (N=24,954)				No arthritis (N=77,006)				P-value**
	N	Pop N	%	95% CI	N	Pop N	%	95% CI	
<b>SPD in past 30 days</b>									
No	22,708	48,642,050	93.2	92.8–93.7	73,699	173,791,379	97.6	97.4–97.7	<0.0001
Yes	1,762	3,534,393	6.8	6.3–7.2	2,066	4,313,184	2.4	2.3–2.6	
<b>Depression*</b>									
Never	5,958	38,535,357	74.4	73.2–75.6	23,146	163,055,889	89.2	88.7–89.7	<0.0001
In the past 12 months	1,718	10,027,107	19.4	18.2–20.5	2,126	13,361,485	7.3	6.9–7.7	
Ever, but not in past 12 months	546	3,234,431	6.2	5.6–6.9	967	6,349,068	3.5	3.2–3.8	
<b>Frequently anxious, past 12 months*</b>									
No	5,694	36,630,280	70.7	69.5–71.9	21,842	153,034,188	83.7	83.1–84.3	<0.0001
Yes	2,531	15,175,040	29.3	28.1–30.5	4,403	29,779,570	16.3	15.7–16.9	
<b>Frequently stressed, past 12 months*</b>									
No	5,068	32,078,458	62.0	60.4–63.5	19,279	134,610,635	73.6	72.9–74.4	<0.0001
Yes	3,154	19,701,791	38.0	36.5–39.6	6,961	48,173,798	26.4	25.6–27.1	

**Notes:** \*Sample sizes are lower because variable was only assessed in the 2012 NHIS, \*\*Wald chi-square test.

**Abbreviations:** CI, confidence interval; NHIS, National Health Interview Survey; SPD, serious psychological distress.

**Table 2** Characteristics of adults with arthritis and SPD compared to adults with arthritis only, NHIS 2011–2013

Characteristics	Arthritis and SPD (N=1,762)		Arthritis and no SPD (N=22,708)		P-value**
	N (%)	95% CI	N (%)	95% CI	
<b>Age (years)</b>					
18–44	365 (23.8)	21.0–26.5	2,985 (14.8)	14.1–15.5	<0.0001
45–64	1,002 (56.7)	53.5–59.8	9,544 (45.8)	44.9–46.7	
≥65	395 (19.5)	17.1–21.9	10,179 (39.4)	38.5–40.2	
<b>Sex</b>					
Male	565 (36.3)	33.4–39.2	8,497 (40.8)	40.0–41.7	0.005
Female	1,197 (63.7)	60.8–66.6	14,211 (59.2)	58.3–60.0	
<b>Race/ethnicity</b>					
White, non-Hispanic	1,135 (73.7)	71.0–76.5	15,959 (77.8)	77.0–78.7	<0.0001
Black, non-Hispanic	276 (11.5)	9.6–13.3	3,647 (11.1)	10.4–11.8	
Hispanic	282 (11.6)	9.8–13.4	2,164 (7.5)	7.0–8.0	
Asian, non-Hispanic	36 (1.8)	1.1–2.6	688 (2.6)	2.3–2.9	
Other	33 (1.4)	0.8–1.9	250 (0.9)	0.7–1.1	
<b>Education</b>					
Less than high school	577 (30.0)	27.3–32.6	3,972 (14.5)	13.9–15.1	<0.0001
High school diploma	525 (2.2)	29.1–35.3	6,494 (29.4)	28.5–30.3	
Some college or Associates degree	517 (30.1)	27.1–33.1	6,951 (31.4)	30.6–32.2	
College or greater	135 (7.7)	6.2–9.2	5,213 (24.8)	23.9–25.7	
<b>Income-to-poverty ratio</b>					
<1	751 (36.0)	32.9–39.1	3,578 (11.5)	11.0–12.0	<0.0001
1 to <2	524 (28.8)	26.1–31.5	5,144 (19.5)	18.8–20.3	
≥2	486 (35.2)	32.0–38.4	13,986 (69.0)	68.0–69.9	
<b>Employment/work status</b>					
Employed	314 (8.1)	15.7–20.5	8,622 (42.0)	41.1–43.0	<0.0001
Retired	257 (14.3)	12.1–16.5	8,807 (35.2)	34.3–36.1	
Disabled	943 (54.1)	50.7–57.5	3,247 (13.1)	12.5–13.7	
Unemployed	135 (7.4)	5.8–8.9	772 (3.4)	3.1–3.7	
Volunteer/NILF	113 (6.1)	4.8–7.5	1,247 (6.2)	5.8–6.7	
<b>Marital status</b>					
Married	530 (41.5)	38.3–44.8	10,035 (58.6)	57.7–59.5	<0.0001
Widowed	257 (11.2)	9.4–13.0	4,517 (13.6)	13.1–14.1	
Divorced/separated	604 (26.8)	24.1–29.5	4,845 (15.0)	14.4–15.5	
Never married	269 (12.6)	10.8–14.4	2,473 (8.4)	7.9–8.8	
Living with partner	98 (7.9)	6.0–9.7	795 (4.5)	4.1–4.8	
<b>Comorbid condition count</b>					
0	265 (16.0)	13.8–18.3	6,071 (29.1)	28.3–29.9	<0.0001
1	406 (25.5)	22.8–28.3	7,035 (31.6)	30.9–32.3	
2	423 (22.7)	20.3–25.1	5,147 (21.6)	21.0–22.3	
≥3	667 (35.8)	32.8–38.7	4,455 (17.7)	17.1–18.3	
<b>Body mass index (BMI)</b>					
Under and normal weight (<25)	476 (28.3)	25.5–31.2	5,847 (26.0)	25.2–26.8	<0.0001
Overweight (25 to <30)	470 (27.3)	24.8–29.9	7,608 (35.1)	34.3–35.9	
Obese (≥30)	771 (44.4)	41.4–47.4	8,521 (38.9)	38.1–39.7	
<b>Physical activity</b>					
Does not meet recommendations	1,428 (82.5)	80.3–84.7	13,963 (60.4)	59.4–61.4	<0.0001
Meets recommendations	304 (17.5)	15.3–19.7	8,356 (39.6)	38.6–40.6	
<b>Self-reported health</b>					
Poor/fair	1,287 (72.1)	69.4–74.8	6,351 (25.5)	24.7–26.3	<0.0001
Good	338 (19.5)	17.2–21.8	7,685 (33.5)	32.7–34.3	
Very good/excellent	136 (8.4)	6.7–10.0	8,658 (41.0)	40.1–41.9	
<b>Functional limitations</b>					
None	89 (5.5)	4.1–7.0	5,969 (28.6)	27.8–29.4	<0.0001
Low	271 (17.3)	14.8–19.8	8,347 (38.4)	37.5–39.2	
Medium	433 (23.3)	20.5–26.1	4,250 (17.5)	16.9–18.1	
High	964 (53.9)	50.3–57.4	4,097 (15.5)	15.0–16.1	

(Continued)

**Table 2** (Continued)

Characteristics	Arthritis and SPD (N=1,762)		Arthritis and no SPD (N=22,708)		P-value**
	N (%)	95% CI	N (%)	95% CI	
<b>Social participation restriction</b>					
No	1,080 (61.4)	58.0–64.7	20,359 (91.1)	90.7–91.6	<0.0001
Yes	680 (38.6)	35.3–42.0	2,327 (8.9)	8.4–9.3	
<b>Depression*</b>					
Never	91 (18.7)	13.6–23.7	5,813 (78.1)	77.0–79.3	<0.0001
In the past 12 months	398 (77.2)	71.8–82.6	1,297 (15.5)	14.4–16.5	
Ever, but not in past 12 months	25 (4.1)	2.2–6.0	519 (6.4)	5.7–7.1	
<b>Frequently anxious, past 12 months*</b>					
No	49 (10.3)	5.9–14.7	5,608 (74.9)	73.7–76.1	<0.0001
Yes	465 (89.7)	85.3–94.1	2,026 (25.1)	23.9–26.3	
<b>Frequently stressed, past 12 months*</b>					
No	37 (6.9)	2.9–10.9	4,995 (65.7)	64.1–67.2	<0.0001
Yes	477 (93.1)	89.1–97.1	2,638 (34.3)	32.8–35.9	
<b>Health insurance</b>					
Any private	473 (30.5)	27.6–33.5	12,813 (61.5)	60.5–62.4	<0.0001
Public only	993 (52.0)	48.9–55.2	8,050 (30.6)	29.8–31.5	
Not covered	290 (17.4)	15.1–19.7	1,800 (7.9)	7.4–8.4	
<b>Could not afford mental health care, past 12 months</b>					
No	1,389 (77.8)	75.2–80.5	22,070 (97.8)	97.6–98.1	<0.0001
Yes	360 (22.2)	19.5–24.8	504 (2.2)	1.9–2.4	
<b>Seen a mental health professional, past 12 months</b>					
No	1,058 (60.8)	57.6–64.0	20,449 (91.0)	90.5–91.4	<0.0001
Yes	681 (39.2)	36.0–42.4	2,093 (9.0)	8.6–9.5	

**Notes:** \*Sample sizes are lower because variable was only assessed in the 2012 NHIS, \*\*Wald chi-square test. All relative standard errors <0.25.

**Abbreviations:** CI, confidence interval; NHIS, National Health Interview Survey; SPD, serious psychological distress; NILF, not in labor force.

(vs. married), having public only health insurance (vs. any private), reported poor/fair health (vs. very good/excellent), and who reported not being able to afford mental health care or counseling. Conversely, those who were older (vs. <45 years), had less than high school education or no additional education beyond high school (vs. college or greater), identified as Asian (vs. non-Hispanic white), or were widowed (vs. married) were less likely to have seen a mental health care professional in the past year (Table 3 for PRs).

The final multivariable model contained the following covariates: age, sex, race, education, employment, insurance, and inability to afford mental health care at any time in the past 12 months. In that model, groups most likely to have seen a mental health professional in the past year were those unable to work due to disability (vs. employed; PR=1.6, 95% CI=1.3–2.1) or the unemployed (vs. employed; PR=1.5, 95% CI=1.1–2.1), and people who reported not being able to afford mental health care in the past 12 months (vs. being able to afford; PR=1.3, 95% CI=1.1–1.6). Conversely, those who were older (vs. <45 years; 45–64 PR=0.8, 95% CI= 0.7–0.9; ≥65 PR=0.4, 95% CI=0.3–0.6), had less than high school education (vs. college or greater; PR=0.5, 95% CI=0.4–0.7) or no additional education beyond high school (vs. college or greater; PR=0.7, 95% CI=0.6–0.9), and those with no health

insurance (vs. private; PR=0.7, 95% CI=0.5–0.8) were less likely to have seen a mental health care professional in the past year. Asian race/ethnicity (vs. White) was no longer statistically significant in the final model.

The interaction between insurance status and ability to afford mental health care in the past year was not significant when added to the final model (data not shown). We, therefore, did not include the interaction term in the adjusted model and did not present stratified results.

## Discussion

Our analysis of nationally representative data estimated that 6.8% of adults with arthritis had SPD – a prevalence proportion almost three times higher than for adults without arthritis. We also found that the 3.5 million adults with arthritis and SPD were more socially disadvantaged, with more comorbidity and limitation, than adults with arthritis only. Six in 10 of adults with arthritis and SPD did not see a mental health care provider in the past year. Older age, lower levels of education, being employed (compared to being disabled or unemployed), and not having health insurance were associated with not seeing a mental health care professional in the past year when controlling for other variables.

The higher proportions of SPD, anxiety, and depression that we found in adults with arthritis when compared to those

**Table 3** Unadjusted and adjusted associations of respondent characteristics with seeing a mental health care provider in the past 12 months among adults with arthritis and SPD in the past 30 days, NHIS 2011–2013

Characteristics	Unadjusted				Final adjusted model (N=1,727)		
	N	PR	95% CI	P-value**	PR	95% CI	P-value**
<b>Age (vs. 18–44)</b>	1,739						
45–64		0.8	0.7–1.0	<0.0001	0.8	0.7–0.9	<0.0001
≥65		0.4	0.3–0.5		0.4	0.3–0.6	
<b>Female (vs. male)</b>	1,739	1.0	0.9–1.2	0.78	1.1	0.9–1.3	0.40
<b>Race/ethnicity (vs. White, non-Hispanic)</b>	1,739						
Black, non-Hispanic		0.9	0.7–1.1	0.06	0.8	0.7–1.0	0.06
Hispanic		0.9	0.7–1.1		1.0	0.9–1.3	
Asian, non-Hispanic		0.3	0.1–0.8		0.3	0.1–1.1	
Other		1.0	0.6–1.6		0.9	0.6–1.5	
<b>Highest education (vs. college or greater)</b>	1,732						
Less than high school		0.6	0.4–0.8	<0.0001	0.5	0.4–0.7	<0.0001
High school diploma		0.8	0.6–1.0		0.7	0.6–0.9	
Some college or associates degree		0.9	0.7–1.2		0.8	0.7–1.0	
<b>Income-to-poverty ratio* (vs. ≥2)</b>	1,739			0.99			
<1		1.0	0.8–1.2				
1 to <2		1.0	0.8–1.2				
<b>Employment status (vs. employed)</b>	1,739						
Retired		0.7	0.5–1.0	<0.0001	1.3	0.9–1.9	<0.0001
Disabled		1.5	1.2–1.9		1.6	1.3–2.1	
Unemployed		1.5	1.1–2.1		1.5	1.1–2.1	
Volunteer/NILF		0.8	0.5–1.3		0.8	0.5–1.3	
<b>Marital status (vs. married)</b>	1,735						
Widowed		0.7	0.5–0.9	0.0003			
Divorced/separated		1.2	1.0–1.4				
Never married		1.4	1.1–1.7				
Living with partner		1.0	0.8–1.4				
<b>Comorbid condition count (vs. none)</b>	1,738						
1		1.1	0.9–1.4	0.40			
2		0.9	0.7–1.2				
3+		1.0	0.8–1.2				
<b>BMI (vs. &lt;25)</b>	1,702						
Overweight (25 to <30)		1.0	0.8–1.2	0.58			
Obese (≥30)		1.1	0.9–1.3				
<b>Does not meet physical activity recommendations (vs. meets recommendations)</b>	1,717	0.9	0.8–1.2	0.56			
<b>Self-rated general health (vs. very good/excellent)</b>	1,738						
Good		1.1	0.8–1.6	0.036			
Poor/fair		1.3	1.0–1.8				
<b>Functional limitations (vs. none)</b>	1,736						
Low		0.7	0.5–1.1	0.12			
Medium		1.0	0.7–1.4				
High		0.9	0.6–1.2				
<b>Social participation restriction (vs. no)</b>	1,739	1.0	0.8–1.2	0.96			
<b>Health insurance (vs. any private)</b>	1,733						
Public only		1.2	1.0–1.5	0.0025	1.1	0.9–1.4	0.0001
Not covered		0.8	0.6–1.1		0.7	0.5–0.8	
<b>Could not afford mental health care, past 12 months (vs. could)</b>	1,739	1.4	1.2–1.7	0.0003	1.3	1.1–1.6	0.017

**Notes:** \*Missing values imputed by survey staff, \*\*Wald chi-square test.

**Abbreviations:** BMI, body mass index; CI, confidence interval; NHIS, National Health Interview Survey; PR, prevalence ratio; SPD, serious psychological distress.

without arthritis are consistent with previous findings. Using 2002 NHIS, Shih et al estimated a prevalence proportion for SPD of 5.6% (CI=5.0%–6.3%).<sup>1</sup> This is slightly lower

than the prevalence proportion (6.8%; CI=6.3%–7.2%) we found in 2011–2013. An analysis of the Arthritis Conditions Health Effects Survey – a nationally representative sample

of US adults ages  $\geq 45$  self-reporting arthritis or chronic joint symptoms in 2005 and 2006 – estimated prevalence proportions for anxiety and depression at 30.5% and 17.5%, respectively, among adults with arthritis.<sup>23</sup> And although that study used validated arthritis-specific instruments to identify those conditions whereas our analysis used the single questions available in 2012 NHIS, those estimates are very similar to our NHIS 2012 estimates (29.3% and 19.4%).

Our results suggest an unmet need for mental health care services in the population with arthritis and SPD and confirm findings from other studies that insurance coverage is an important barrier to mental health care.<sup>41</sup> Because treating depression in individuals with arthritis can improve outcomes,<sup>19</sup> screening for anxiety and depression in arthritis patients should be routine,<sup>23</sup> particularly if patients are unlikely to bring up mental health concerns with providers on their own.<sup>42,43</sup>

Income was not associated with seeing a mental health care professional in the past year, an indication that health insurance or other nonfinancial barriers may play a larger role in receiving care. For example, stigmas about mental illness<sup>42</sup> or the belief that mental health problems can be overcome on their own<sup>26,42</sup> have been identified as significant barriers to treatment. And while those of Asian race/ethnicity were less likely to receive mental health care in the past year (vs. White, non-Hispanic), this association was of borderline statistical significance in the final adjusted model (PR=0.3, 95% CI=0.1–1.1), but is consistent with other reports that stigmatization of mental health conditions may be particularly important in this population.<sup>44,45</sup> Lack of continuity of care with primary health care providers has also been reported as a hindrance to establishing the comfort level needed for patients to initiate conversations about mental health problems.<sup>42</sup> These nonfinancial barriers were not measured in NHIS but could provide further explanation for not receiving care and highlight the importance of addressing both financial and nonfinancial barriers to care.

One seemingly counter-intuitive finding, among those with arthritis and SPD, not being able to afford mental health care at some point in the past year was also associated with seeing a mental health professional (PR=1.3; 95% CI=1.1–1.6). This may indicate that although these individuals were able to see a mental health care professional in the past year, they may not be getting the full extent of care required. This would be consistent with findings from one survey-based study reporting that 26% of adults with self-reported arthritis who had difficulty receiving mental health care services cited “limits on the number of visits” as the reason for not obtaining care.<sup>26</sup> Cost of care is an important health policy challenge, and strategies such as community-based chronic

disease self-management programs (CDSMPs) should be considered as potential low-cost option to improve the mental health of adults with arthritis, particularly because CDSMPs have demonstrated the ability to improve both physical and psychological health in individuals with chronic disease.<sup>46</sup> Another low-cost approach to improve physical and psychological health among adults with arthritis is walking programs (e.g., Walk with Ease). In controlled trials of walking programs, adults with arthritis have demonstrated decreased pain and depression and increased mobility and physical performance.<sup>47</sup>

Our study includes several important limitations. First of all, arthritis status was based on self-report and, therefore, subject to misclassification; however, this question has demonstrated a high positive predictive value in a clinic-based validation study.<sup>48</sup> Because NHIS data are cross-sectional, we could not investigate causality between seeing a mental health care provider in the past year and the correlates we identified. As mentioned in the “Materials and methods” section, arthritis status was determined by a question that also includes other rheumatic and joint disorders (gout, lupus, fibromyalgia), and there may be differences in the prevalence of SPD or access to mental health care services for these different disorders that unfortunately cannot be ascertained from this survey data. Finally, although one of our objectives was to assess the unmet need for mental health care among adults with arthritis and SPD, we could only examine a proxy measure, having seen a mental health care provider in the past year. Strengths of this analysis include use of an up-to-date sample of nationally representative adults and a validated instrument to identify SPD.

Because mental health conditions, such as anxiety and depression, and severe manifestations of these conditions, such as SPD in particular, can exacerbate arthritis-related pain, fatigue, and disability, identifying these conditions in adults with arthritis is an important priority in primary care. Subsequent referral of these individuals to a mental health care provider or other mental health treatment programs may help satisfy the unmet need for treatment. While barriers to mental health treatment due to lack of insurance or insufficient mental health benefits will need to be addressed at a policy level, lower cost interventions such as CDSMPs may serve as alternative strategies to improve mental health in individuals with barriers to mental health treatment, as well as for individuals who may be reluctant to see a mental health care provider.

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