Serious Psychological Distress in U.S. Adults with Arthritis

Margaret Shih, MD, PhD,¹ Jennifer M. Hootman, PhD,² Tara W. Strine, MPH,²
Daniel P. Chapman, PhD, MSc,² Teresa J. Brady, PhD²

¹Office of Health Assessment and Epidemiology, Los Angeles County Department of Public Health, Los Angeles, CA, USA;

²Division of Adult and Community Health, Centers for Disease Control and Prevention, Atlanta, GA, USA.

BACKGROUND: Arthritis and mental health disorders are leading causes of disability commonly seen by health care providers. Several studies demonstrate a higher prevalence of anxiety and depression in persons with arthritis versus those without arthritis.

OBJECTIVES: Determine the national prevalence of serious psychological distress (SPD) and frequent anxiety or depression (FAD) in adults with arthritis, and in adults with arthritis, identify risk factors associated with SPD.

METHODS: Cross-sectional data from the 2002 National Health Interview Survey, an in-person household interview survey, were used to estimate the prevalence of SPD and FAD in adults with ($n=6,829$) and without ($n=20,676$) arthritis. In adults with arthritis, the association between SPD and sociodemographic, clinical, and functional factors was evaluated using multivariable logistic regression.

RESULTS: The prevalence of SPD and FAD in adults with arthritis is significantly higher than in adults without arthritis (5.6% vs 1.8% and 26.2% vs 10.7%, $P<.001$, respectively). In adults with arthritis, SPD was significantly associated with younger age, lower socioeconomic status, divorce/separation, recurrent pain, physical inactivity, having functional or social limitations, and having comorbid medical conditions. Adults aged 18 to 44 years were 6.5 times more likely to report SPD than those 65 years or older, and adults with recurrent pain were 3 times more likely to report SPD than those without recurrent pain.

CONCLUSIONS: Serious psychological distress and FAD affect persons with arthritis and should be addressed in their treatment. Younger adults with arthritis, and those with recurrent pain or either functional or social limitations, may be at higher risk for SPD.

KEY WORDS: arthritis; mental health; depression; anxiety; psychological distress.

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Arthritis affected 43 million U.S. adults in 2002¹ and is the leading cause of disability in the United States.² Three of 10 working age adults with arthritis report some arthritis-attributable work limitation.¹ Moreover, arthritis substantially impairs health-related quality of life, increasing both physically and mentally unhealthy days.³ Several studies have reported a higher prevalence of major depression, anxiety, and depressive symptoms in persons with arthritis.^{4–6} Notably, a recent study in a national sample of 54- to 65-year-olds estimated the attributable risk of major depression due to arthritis to be 18%, comparable with the attributable risk due to heart disease.⁷

Both arthritis and mental health disorders are commonly seen by health care providers. Determining the prevalence of psychological distress in persons with arthritis is important because impaired mental health increases disability while decreasing quality of life, the ability to cope with illness, and responsiveness to treatment interventions.^{8–11} Furthermore, patients, particularly those with chronic medical conditions, place nearly as high a value on mental health as on physical health.¹² Most prevalence studies thus far have been conducted in clinical settings,⁴ and only a few have assessed mental health in community samples.^{13,14}

This investigation uses National Health Interview Survey (NHIS) data from 2002 to (1) determine the national prevalence of serious psychological distress (SPD) in the past 30 days¹⁵ and frequent anxiety or depression (FAD) in the past 12 months in adults with self-reported doctor-diagnosed arthritis compared with adults without arthritis, and (2) in the subset of adults with arthritis, identify sociodemographic and other risk factors associated with SPD.

METHODS

Data Source

The NHIS is an ongoing, national, in-person household interview survey designed to represent the United States civilian, noninstitutionalized population, and uses a multistage, complex sampling design.¹⁶ The 2002 sample adult component used in this analysis included persons 18 years and older (median age of 45.2 years) and had a response rate of 74.3% ($n=31,044$).¹⁷

Variables

Arthritis. Patients with self-reported doctor-diagnosed arthritis ($n=6,829$), hereafter called arthritis, were identified by a “yes” response to 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?” This variable matches the CDC recommended definition of arthritis commonly used in disease surveillance reports.¹⁸ Respondents who answered “no” and who did not have chronic joint symptoms (i.e., joint symptoms lasting 3 months or more) comprised the no arthritis group ($n=20,676$). The 3,397 respondents with possible arthritis (i.e., chronic joint symptoms but no self-reported doctor-diagnosed arthritis) were excluded from the analysis because their arthritis status was not clear. Condition-specific data on type of arthritis were not

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Address correspondence and requests for reprints to Dr. Shih: Office of Health Assessment and Epidemiology, Los Angeles County Department of Public Health, 313 N. Figueroa Street, Rm 127, Los Angeles, CA 90012 (e-mail: mshih@ladhs.org).

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available. Information regarding arthritis status was missing for 142 respondents.

SPD and FAD. Serious psychological distress is a nonspecific measure of psychological distress that has been psychometrically validated and shown to be able to discriminate community DSM-IV cases from noncases.¹⁹⁻²¹ It is intended to characterize having at least 1 mental disorder, such as major depressive disorder, generalized anxiety disorder, or schizophrenia, as well as having serious impairment in functioning. Serious psychological distress is determined using the Kessler 6 (K6) scale, which comprises 6 questions asking how often during the past 30 days a person felt “so sad that nothing could cheer them up,” “nervous,” “restless,” “hopeless,” “worthless,” or that “everything was an effort.” Responses are scored from 0 (none of time) to 4 (all the time) and summed to produce a total score (0 to 24), with a score of 13 or above used to define SPD.¹⁹ Only respondents who had complete information for all 6 questions were included. The 2002 NHIS also included a question about frequent symptoms of anxiety or depression; FAD in the past year was determined by a “yes” response to the question, “During the past 12 months, have you been frequently depressed or anxious?”

Covariates. Independent variables that have previously demonstrated an association with poor mental health in persons with arthritis were included in an initial multivariable logistic regression model.^{5,13,14,21} These variables included age (18 to 44, 45 to 64, 65+), gender, race or ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, non-Hispanic other/multiple race), education ($\leq$ high school, $>$ high school), income ($<$ \$20,000, \$20,000+), marital status (married, widowed, divorced/separated, never married, living with partner), and body mass index ($\text{BMI} = \text{weight [kg]} / \text{height [m]}^2$; <25 , underweight to normal weight; 25 to <30 , overweight; 30+, obese). Respondents reporting joint symptoms were asked to rate the severity of their joint pain during the past 30 days on a scale from 0 to 10 (0 to 3, little to none; 4 to 6, moderate; 7+, severe). Respondents reporting no joint symptoms were categorized as having no (0) joint pain. Presence of chronic or recurrent pain during the past year, which was not restricted to joint pain, was assessed by the question, “During the past 12 months, have you had recurring pain?” Respondents who reported never participating in, or being unable to participate in, light, moderate, or vigorous physical activity for at least 10 min/occasion were defined as physically inactive. Respondents had at least 1 of 3 social/leisure limitations if they reported it was “very difficult” or they were “unable to” “Go out to things like shopping, movies, or sporting events”; “Participate in social activities such as visiting friends, attending clubs and meetings, going to parties”; or “Do things to relax at home or for leisure.”

Respondents' health status was assessed by the presence of functional limitations, need for special equipment, and comorbid medical conditions. Respondents were categorized as having 0, 1 to 3, or 4 or more functional limitations by the number of times they responded “very difficult” or “unable to” for a list of 9 activities: walk a quarter mile, walk up 10 steps, stand for 2 hours, sit for 2 hours, stoop/bend/kneel, reach overhead, grasp small objects, lift/carry up to 10 pounds, and push/pull large objects. Having a health problem requiring the use of special equipment was determined by the question, “Do you

now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?”

Respondents were asked about the presence or absence of each of the following 16 medical conditions: hypertension, high cholesterol, back pain, neck pain, cardiovascular condition (angina, congestive heart failure, myocardial infarction, coronary heart disease, other heart condition), stroke, respiratory condition (asthma, emphysema, chronic bronchitis), thyroid problem, neurologic condition (multiple sclerosis, Parkinson's disease, neuropathy, seizures), cancer, diabetes, weak or failing kidneys, liver condition, vision problem (difficulty seeing, blindness, retinopathy, cataracts, glaucoma, macular degeneration), hearing impairment, or gastrointestinal condition (ulcer, inflammatory bowel, irritable bowel, severe constipation).

To create a variable for medical comorbidity, hierarchical logistic regression was performed to identify which self-reported medical conditions were associated with SPD. All conditions except cancer demonstrated a significant univariate association with SPD in persons with arthritis. Stepwise logistic regression using the remaining 15 conditions was performed at a significance level of 0.10. Testing for multicollinearity was conducted. Eight medical conditions were identified as being associated with SPD: respiratory conditions, gastrointestinal conditions, neurologic conditions, kidney disease, liver conditions, neck pain, back pain, and vision problems. A categorical variable indicating the number of associated comorbid conditions present (0 to 1, 2 to 3, 4 to 8) was created.

Statistical Analyses

Prevalence of SPD and FAD in adults with and without arthritis was estimated using sample adult weights. Using only the subsample of adults with arthritis, logistic regression analysis was performed to examine the association between SPD and covariates listed above. We chose to conduct regression analyses for SPD only. While FAD is of interest because it may provide an estimate of anxiety or depression over the past year, it involves use of a single question, and the authors were not aware of it having been previously validated. Crude odds ratios for SPD in adults with arthritis were calculated, and a series of multivariable logistic regression models were run, with the initial model including all covariates, including the categorical number of associated medical conditions. Sociodemographic variables and BMI were retained in the model whether or not they were significant. Joint pain in the past 30 days and need for special equipment were not significant in the intermediate model and thus were excluded from subsequent models. Tests for interactions of all remaining covariates with age, gender, and BMI, and between functional limitations and physical inactivity were conducted. No significant interactions were found. All reported prevalence estimates and adjusted and unadjusted odds ratios were calculated in SUDAAN (version 9.0.0; Research Triangle Institute, Research Triangle Park, NC) to account for the complex sampling design. A significance level of $\alpha = 0.05$ was used.

RESULTS

A description of the characteristics of the study population can be found in Table 1. The prevalence of SPD in adults

with arthritis (5.6%) was nearly twice that of the overall U.S. adult population (3.0%)¹⁵ and more than 3 times that of persons without arthritis (1.8%, $P < .001$). The prevalence of FAD was also significantly higher in adults with arthritis

(26.2%) compared with those without arthritis (10.7%, $P < .001$). Among adults with arthritis, the prevalence of SPD was significantly higher among women, 18- to 44-year-olds, Hispanics and non-Hispanic others, and those who were

Table 1. Characteristics of the Study Population*, Overall and by Arthritis Status

Characteristic	Weighted % (95% CI)		
	Overall (n=31,044)	Arthritis [†] (n=6,829)	No Arthritis [‡] (n=20,676)
Age (y)			
18 to 44	52.5 (51.7 to 53.4)	19.8 (18.7 to 21.0)	63.1 (62.1 to 64.0)
45 to 64	31.4 (30.8 to 32.1)	43.4 (41.9 to 44.8)	27.1 (26.3 to 27.9)
65+	16.1 (15.5 to 16.6)	36.8 (35.4 to 38.3)	9.9 (9.4 to 10.4)
Gender			
Women	52.0 (51.3 to 52.8)	60.6 (59.1 to 62.0)	50.1 (49.2 to 51.0)
Race/ethnicity			
White, non-Hispanic	72.7 (71.8 to 73.5)	80.4 (79.1 to 81.6)	69.6 (68.7 to 70.6)
Black, non-Hispanic	11.2 (10.6 to 11.9)	10.5 (9.6 to 11.4)	11.6 (10.9 to 12.4)
Hispanic	11.0 (10.5 to 11.6)	6.2 (5.6 to 6.8)	12.9 (12.3 to 13.6)
Other/multiple, non-Hispanic	5.1 (4.7 to 5.5)	3.0 (2.5 to 3.6)	5.8 (5.4 to 6.3)
Education			
≤ High school	45.9 (45.1 to 46.8)	52.4 (50.9 to 53.8)	43.9 (42.9 to 44.9)
Income			
< \$20,000	18.2 (17.5 to 18.8)	23.2 (22.0 to 24.4)	16.7 (16.0 to 17.5)
Marital status			
Married	57.8 (57.0 to 58.6)	58.6 (57.2 to 60.1)	57.3 (56.3 to 58.3)
Widowed	6.4 (6.1 to 6.6)	14.6 (13.8 to 15.5)	3.9 (3.7 to 4.2)
Divorced/separated	10.3 (10.0 to 10.7)	14.1 (13.3 to 14.9)	9.0 (8.6 to 9.4)
Never married	19.4 (18.7 to 20.2)	8.1 (7.3 to 9.0)	23.4 (22.4 to 24.3)
Living with partner	5.8 (5.5 to 6.1)	4.5 (3.9 to 5.1)	6.1 (5.7 to 6.5)
Body mass index			
Under/normal weight	39.5 (38.7 to 40.2)	28.9 (27.7 to 30.2)	43.5 (42.6 to 44.4)
Overweight	33.4 (32.7 to 34.0)	33.3 (32.0 to 34.6)	33.1 (32.4 to 33.9)
Obese	22.4 (21.8 to 23.0)	33.2 (31.9 to 34.5)	18.4 (17.7 to 19.0)
Recurrent pain			
Yes	18.1 (17.5 to 18.7)	44.0 (42.5 to 45.5)	7.3 (6.8 to 7.7)
Joint pain			
Little to none (0 to 3)	78.3 (77.7 to 78.8)	42.5 (41.0 to 44.0)	97.1 (96.8 to 97.3)
Moderate (4 to 6)	12.7 (12.3 to 13.2)	30.9 (29.7 to 32.2)	1.8 (1.6 to 2.0)
Severe (7 to 10)	8.2 (7.8 to 8.5)	24.6 (23.4 to 25.9)	1.0 (0.9 to 1.2)
Physically inactive			
Yes	36.7 (35.7 to 37.7)	42.9 (41.3 to 44.5)	35.7 (34.5 to 36.8)
Need special equipment			
Yes	5.5 (5.2 to 5.8)	16.6 (15.7 to 17.7)	1.8 (1.6 to 2.1)
Functional limitations [§]			
0	86 (85.4 to 86.5)	59.6 (58.0 to 61.1)	95.0 (94.6 to 95.4)
1 to 3	8.8 (8.4 to 9.2)	23.8 (22.6 to 25.0)	3.4 (3.1 to 3.7)
4 or more	5.0 (4.7 to 5.3)	16.2 (15.2 to 17.4)	1.4 (1.2 to 1.6)
Social/leisure limitations [¶]			
0	96.2 (96.0 to 96.5)	89.4 (88.5 to 90.2)	98.5 (98.3 to 98.7)
1 or more	3.4 (3.1 to 3.6)	9.9 (9.1 to 10.8)	1.2 (1.1 to 1.4)
Associated comorbid conditions			
0 to 1	76.7 (76.2 to 77.3)	50.3 (49.0 to 51.7)	87.1 (86.5 to 87.6)
2 to 3	19.8 (19.3 to 20.3)	38.7 (37.4 to 40.0)	12.1 (11.6 to 12.6)
4 to 8	3.4 (3.2 to 3.7)	11.0 (10.2 to 11.8)	0.8 (0.7 to 1.0)
Serious psychological distress (SPD) [#]			
Yes	3.0 (2.8 to 3.3)	5.6 (5.0 to 6.3)	1.8 (1.6 to 2.0)
Frequent anxiety or depression (FAD)			
Yes	15.7 (15.2 to 16.3)	26.2 (24.9 to 27.5)	10.7 (10.2 to 11.2)

*Data are from the 2002 National Health Interview Survey. Nonresponse was approximately 1.2% for education, 6.5% for income, 4.8% for body mass index, 2.1% for physical inactivity, 2.3% for SPD, and < 1% for other footnoted variables.

[†]Respondents with self-reported doctor-diagnosed arthritis.

[‡]Respondents who reported not having doctor-diagnosed arthritis or possible arthritis (i.e., joint symptoms ≥ 3 months).

[§]Number of rating the following 9 activities rated as very difficult or unable to do: walk a quarter mile, walk up 10 steps, stand for 2 hours, sit for 2 hours, stoop/bend/kneel, reach overhead, grasp small objects, lift/carry up to 10 pounds, and push/pull large objects.

[¶]Number of rating the following 3 activities rated as very difficult or unable to do: "Go out to things like shopping, movies, or sporting events," "Participate in social activities such as visiting friends, attending clubs and meetings, going to parties," or "Do things to relax at home or for leisure."

^{||}Number of comorbid medical conditions associated with SPD: respiratory conditions, gastrointestinal conditions, neurologic conditions, kidney disease, liver conditions, neck pain, back pain, and vision problems.

[#]Serious psychological distress in the past 30 days (defined by a score ≥ 13 on Kessler scale¹⁹).

less educated, had a lower income, were divorced or separated, were obese, had recurrent pain, had moderate to severe joint pain, were physically inactive, needed special equipment, had 1 or more functional limitations, had 1 or more

social/leisure limitations, or had 2 or more comorbid conditions associated with SPD (Table 2). The prevalence of FAD among these subgroups followed similar patterns as SPD (Appendix).

Table 2. Prevalence and Odds of Serious Psychological Distress (SPD) in Adults with Arthritis, by Selected Characteristics

Characteristic	Weighted % (± SE)		
	SPD Prevalence*	Crude OR (95%CI)	Adjusted OR† (95%CI)
Age (y)			
18 to 44	8.0 (0.9)	3.6 (2.5 to 5.2)	6.5 (4.1 to 10.4)
45 to 64	7.5 (0.6)	3.4 (2.4 to 4.6)	4.4 (3.0 to 6.4)
65+	2.4 (0.3)	1.0	1.0
Gender			
Men	4.2 (0.4)	1.0	1.0
Women	6.7 (0.5)	1.7 (1.3 to 2.1)	1.3 (1.0 to 1.8)
Race/ethnicity			
White, non-Hispanic	5.1 (0.4)	1.0	1.0
Black, non-Hispanic	6.4 (1.0)	1.3 (0.9 to 1.8)	0.7 (0.4 to 1.0)
Hispanic	9.1 (1.3)	1.9 (1.3 to 2.6)	1.3 (0.9 to 2.1)
Other/multiple, non-Hispanic	13.8 (3.6)	3.0 (1.6 to 5.5)	1.8 (0.9 to 3.5)
Education			
≤ High school	7.4 (0.5)	2.0 (1.5 to 2.5)	1.7 (1.3 to 2.2)
> High school	3.9 (0.4)	1.0	1.0
Income			
< \$20,000	12.3 (1.0)	3.7 (2.9 to 4.7)	2.0 (1.5 to 2.8)
\$20,000+	3.7 (0.3)	1.0	1.0
Marital status			
Married	4.2 (0.4)	1.0	1.0
Widowed	4.5 (0.6)	1.1 (0.8 to 1.5)	1.0 (0.7 to 1.7)
Divorced/separated	10.9 (1.0)	2.8 (2.1 to 3.7)	1.5 (1.1 to 2.0)
Never married	8.5 (1.3)	2.1 (1.5 to 3.1)	1.3 (0.9 to 1.9)
Living with partner	8.2 (2.1)	2.0 (1.1 to 3.7)	0.8 (0.4 to 1.7)
Body mass index			
Under/normal weight	5.1 (0.5)	1.0	1.0
Overweight	5.2 (0.5)	1.0 (0.8 to 1.4)	1.1 (0.8 to 1.6)
Obese	6.8 (0.6)	1.4 (1.1 to 1.8)	0.9 (0.7 to 1.2)
Recurrent pain			
No	1.8 (0.2)	1.0	1.0
Yes	10.7 (0.7)	6.6 (4.9 to 9.0)	3.0 (2.1 to 4.2)
Joint pain			
Little to none (0 to 3)	2.4 (0.3)	1.0	‡
Moderate (4 to 6)	4.5 (0.5)	1.9 (1.3 to 2.7)	–
Severe (7 to 10)	13.2 (0.9)	6.2 (4.5 to 8.5)	–
Physical inactivity			
Active	3.5 (0.4)	1.0	1.0
Inactive	8.7 (0.6)	2.6 (2.1 to 3.4)	1.6 (1.2 to 2.1)
Need special equipment			
No	4.7 (0.3)	1.0	‡
Yes	11.2 (1.1)	2.6 (2.0 to 3.3)	–
Functional limitations§			
0	2.0 (0.3)	1.0	1.0
1 to 3	7.8 (0.7)	4.1 (3.0 to 5.6)	2.5 (1.8 to 3.6)
4 or more	16.6 (1.3)	9.7 (7.0 to 13.3)	2.4 (1.5 to 3.8)
Social/leisure limitations¶			
0	4.0 (0.3)	1.0	1.0
1 or more	20.5 (1.7)	6.2 (4.8 to 8.0)	2.2 (1.5 to 3.2)
Associated comorbid conditions			
0 to 1	2.0 (0.3)	1.0	1.0
2 to 3	5.9 (0.5)	3.0 (2.2 to 4.2)	1.5 (1.0 to 2.2)
4 to 8	22.5 (1.7)	14.1 (10.1 to 19.7)	4.4 (2.9 to 6.8)

*Serious psychological distress in the past 30 days (defined by a score ≥ on Kessler scale¹⁹).

†Adjusted for all other covariates in model except joint pain and need for special equipment.

‡Not significant in multivariable logistic regression model and dropped from adjusted model.

§Number of rating the following 9 activities rated as very difficult or unable to do: walk a quarter mile, walk up 10 steps, stand for 2 hours, sit for 2 hours, stoop/bend/kneel, reach overhead, grasp small objects, lift/carry up to 10 pounds, and push/pull large objects.

¶Number of rating the following 3 activities rated as very difficult or unable to do: "Go out to things like shopping, movies, or sporting events," "Participate in social activities such as visiting friends, attending clubs and meetings, going to parties," or "Do things to relax at home or for leisure."

||Number of comorbid medical conditions associated with SPD: respiratory conditions, gastrointestinal conditions, neurologic conditions, kidney disease, liver conditions, neck pain, back pain, and vision problems.

In adults with arthritis, age <65 years, lower education, lower income, divorce or separation, recurrent pain, physical inactivity, having 1 or more functional limitations or social/leisure limitations, and having 2 or more associated comorbid conditions were found to be associated with increased odds of SPD after adjustment for covariates using multivariable logistic regression modeling (Table 2). The association between age and SPD was particularly striking, with adults 18 to 44 years of age 6.5 (95% CI 4.1 to 10.4) times more likely than those 65 years or older to have SPD. Female gender and obesity were no longer significant after adjustment, and non-Hispanic blacks were slightly less likely (adjusted OR=0.7; 95% CI 0.4 to 1.0) to report SPD than non-Hispanic whites.

DISCUSSION

In this study, we found the national prevalence of both SPD and FAD to be significantly higher in adults with arthritis than in those without arthritis, with SPD prevalence 3 times higher and FAD prevalence 2.5 times higher. Frequent anxiety and depression in the past year (FAD) was common, with 1 in 4 adults with arthritis reporting FAD. After adjustment for covariates, SPD in the past 30 days was significantly associated with younger age, lower socioeconomic status, being divorced or separated, having recurrent pain, being physically inactive, and having more limitations or medical comorbidities in adults with arthritis.

These findings are consistent with other smaller studies of specialized populations that have found higher rates of anxiety, major depression, and depressive symptoms in persons with arthritis.^{5,6,22} One large community-based study¹⁴ found the prevalence of frequent mental distress (≥ 14 mentally unhealthy days in the past 30 days) to be 13.4% among adults with arthritis who were 45 years and older. Although the results of that study are not directly comparable because different definitions of mental health and arthritis and a state-based data source were used, it corroborates the higher prevalence of mental distress in adults with arthritis compared with adults without arthritis.

Higher rates of depression and depressive symptoms in younger adults relative to older adults with arthritis have also been shown in previous studies.^{7,13,23} Although the reasons for this association remain unclear, studies in patients with rheumatoid arthritis^{22,24,25} suggest that depressive symptoms in younger adults and adolescents with arthritis are related to less effective coping strategies and higher perceived stress and pain.^{22,25} Because arthritis is a nonnormative event in younger adults, these higher rates of depression and depressive symptoms may be related to a greater perceived impact on family life, work, and leisure activities.^{26,27} Also, adults 18 to 44 years of age may be developing more systemic forms of arthritis, such as rheumatoid arthritis and systemic lupus erythematosus, which can have more severe manifestations. Finally, more recent birth cohorts have been found to be at increased risk for major depression.²⁸ Longitudinal studies of mental health in persons with specific types of arthritis are needed to help discriminate between the roles of age versus birth cohort and to elucidate the relationship of age to psychological distress in specific types of arthritis.

Previous research has consistently shown depression to be associated with pain, functional impairment, and loss of valued activities in persons with arthritis^{4,7,29-32} and suggests

that the relationship of pain and loss of function to depression is closely linked and bi-directional.^{33,34} Improvement of depression has been associated with improved functional status,^{35,36} and at least 1 randomized-controlled trial has shown that enhancing depression care in older adults with arthritis results in less pain and better function and quality of life.³⁷ Furthermore, pain appears to be undertreated in depressed older adults with pain-related functional impairment.³⁸ Improving pain management may not only directly benefit mental health and physical functioning but may also assist with increasing physical activity levels.

Lack of physical activity, which has been associated with depression and depressive symptoms in this and other studies,^{14,39} is another important modifiable risk factor in persons with arthritis that can mediate multiple contributing factors to mental well-being, including decreasing pain, improving function, delaying disability, and decreasing the risk of obesity and other chronic diseases that may further add to depressive symptoms.⁴⁰⁻⁴² Several studies have shown exercise to be similarly effective to medication or cognitive behavioral therapy in treating major depression,^{43,44} but 1 meta-analysis, which was restricted to randomized-controlled trials of clinically depressed patients, cautions that although exercise appears to be effective in reducing depressive symptoms in the short term, studies with long-term follow-up are lacking.⁴⁵ In persons with arthritis, increased physical activity has been shown to have significant mental health benefits⁴⁶ and to be associated with fewer physically and mentally unhealthy days.⁴⁷ Unfortunately, the prevalence of adults with arthritis who are not physically active remains high,⁴⁸ while arthritis-related physical activity counseling by health care providers remains low⁴⁹ and represents a missed opportunity to help our patients and to meet Healthy People 2010 objectives. Existing evidence-based interventions such as the Arthritis Foundation Arthritis Self-Help Course,⁵⁰ which is a group self-management education program, and the Arthritis Foundation Exercise Program, which is a community-based exercise program, have been shown to reduce pain and symptoms of anxiety and depression while improving function and activity levels.⁵¹ Efforts to expand access to these programs should be continued.

There are several limitations of the present study. One important limitation was that the data source did not contain information on what type of arthritis the respondent had, so we were not able to examine SPD or FAD in relation to specific rheumatic conditions. Second, due to the self-report nature of the data, which is subject to recall bias, patients with SPD or FAD may be more likely to recall being told by a health care provider that they have arthritis, resulting in misclassification bias. While data are not available to directly address this issue, 2 validation studies have shown the case definition used to be valid for public health surveillance and suggest that this is not a significant issue.^{52,53} Third, the use of cross-sectional survey data cannot be used to infer causation, and while we attempted to adjust for potential confounders as the data allowed, some confounders may not have been taken into account. Another limitation is that some of the K6 items, particularly the question asking whether "everything is an effort," may overlap with somatic symptoms of arthritis; however, the pattern of responses across individual items appeared similar in persons with and without arthritis. Finally, the survey population included only noninstitutionalized persons, so some adults with severe arthritis or depression may have been missed.

This study has several important strengths. We provide the first national prevalence estimates for SPD and FAD in persons with arthritis, using a nationally representative sample of U.S. adults. Also, we were able to adjust for potential confounders in evaluating factors associated with SPD, including comorbid medical conditions, which is not possible with some data sources. Future research should focus on longitudinal studies of specific types of mental health problems, including depression and anxiety, in adults with different types of arthritis, specifically looking at the effects of age and physical activity. Younger adults with arthritis should be included in programs designed to help people with arthritis of all ages.

Mental health disorders remain underdiagnosed⁵⁴ and undertreated⁵⁵ in persons with arthritis, contributing to treatment noncompliance, poor response to treatment, higher disability rates, poor quality of life, and increased health care utilization among persons who seek medical care. There are many brief screening tools available for use in the clinical setting to facilitate diagnosis.^{56,57} Mental health impairment should be recognized, addressed, and followed-up by health care providers who care for adults with arthritis, especially among patients who are younger, have recurrent pain, or report limitations in either functional or social activities. Additional emphasis should be placed on physical activity counseling and pain management because these interventions may foster better mental health in addition to delaying physical disability.

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Supplementary Material

The following supplementary material is available for this article online at www.blackwell-synergy.com

Appendix. Prevalence of SPD and FAD in U.S. Adults, by Arthritis Status and Selected Characteristics, 2002 NHIS.