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SERIOUS PSYCHOLOGICAL DISTRESS AMONG US ADULTS WITH ARTHRITIS:  
PREVALENCE AND BARRIERS TO RECEIVING CARE

BY

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An abstract of  
A Thesis submitted to the Faculty of the  
Rollins School of Public Health of Emory University  
in partial fulfillment of the requirements of the degree of  
Master of Public Health in the Executive MPH program  
2015

## Abstract

### SERIOUS PSYCHOLOGICAL DISTRESS AMONG US ADULTS WITH ARTHRITIS: PREVALENCE AND BARRIERS TO RECEIVING CARE

BY

Laura Straub

**Background:** For those with arthritis, mental health comorbidities can exacerbate disability, interfere with disease management, and are associated with worse outcomes. Interventions to improve mental health among individuals with arthritis have demonstrated improvements in both psychological and physical outcomes, underscoring the importance of identifying and treating individuals with arthritis and concomitant mental health comorbidities.

**Objectives:** Estimate the prevalence of SPD and other relevant characteristics among US adults with self-reported arthritis compared to those without arthritis; determine the distribution of relevant characteristics among the adult population with arthritis and SPD; and, use multivariable modeling to examine characteristics associated with receiving mental health care in the past year for the subset of adults with arthritis and SPD.

**Methods:** This analysis used sample adult data from the 2011-2013 National Health Interview Survey (NHIS) (N=102,096). Prevalence of SPD and other characteristics was calculated for the populations with arthritis (N=24,954) and without arthritis (N=77,006). Using the subset of adults with arthritis and SPD (N=1762), logistic regression was used to identify correlates of receiving mental health care in the past year.

**Results:** The arthritis population has higher prevalence of SPD compared to the adult population without arthritis (6.8% vs. 2.4%). Among the subset of individuals with arthritis and SPD, being Asian (OR=0.2, 95% CI=0.0-0.8), lacking health insurance (OR=0.5, 95% CI=0.3-0.7) and having less education (OR=0.3, 95% CI=0.2-0.5) make it less likely to have seen a mental health professional in the past year (controlling for other variables). Not being able to afford mental health care was also associated with seeing a mental health professional in the past year (OR=1.6, 95% CI=1.1-2.4).

**Conclusion:** This data suggests the need to increase delivery of mental health services to individuals with arthritis and SPD, and revealed certain populations who may experience gaps in adequate mental health treatment (low education, lack of health insurance). Not being able to afford mental health care or counseling in the past year was also associated with seeing a mental health professional in the past year (OR=1.6, 95% CI 1.1-2.4) (a counterintuitive finding). This may suggest limits on coverage preventing the full extent of care required.

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## **ACKNOWLEDGEMENTS**

I would like to thank my field advisor and Committee Member, Miriam Cisternas, for sharing her expertise and guidance throughout this project. I truly have learned more than I could have ever expected.

I would also like to thank Dr. Lyndsey Darrow, my Committee Chair, for her valuable insights and thorough review and consideration of my work throughout this process.

Table of Contents

<b>INTRODUCTION</b> .....	1
<b>METHODS</b> .....	2
<b>RESULTS</b> .....	6
<b>DISCUSSION</b> .....	10
<b>CONCLUSIONS</b> .....	13
<b>REFERENCES</b> .....	14
<b>TABLE 1</b> .....	16
<b>TABLE 2</b> .....	18
<b>TABLE 3</b> .....	20
<b>APPENDIX A: Variable Definitions and Recodes</b> .....	22
<b>APPENDIX B: Other Models</b> .....	30

## INTRODUCTION

Arthritis is the leading cause of disability in the US [1], and can substantially worsen health-related quality of life [2, 3]. The prevalence of mental health comorbidities such as Serious Psychological Distress (SPD), depression, and anxiety has been shown to be higher among adults with arthritis compared to the general population [4-6]. Mental health comorbidities in individuals with arthritis are part of a complex web of relationships that also include pain, fatigue, and disability [7-12]. These can relate to each other as both exposures and outcomes: deterioration in one area can directly or indirectly affect the other three. Mental health comorbidities are of concern for individuals with arthritis and other chronic diseases because they have been shown to exacerbate disability [13, 14], interfere with disease management [15, 16], and are associated with worse outcomes [17, 18]. Interventions to improve mental health among individuals with arthritis have been shown to improve both psychological and physical outcomes [19-22], underscoring the importance of identifying and treating individuals with arthritis and concomitant mental health comorbidities.

Access to adequate mental health care is an important policy issue for the US population at large. Common barriers to receiving mental health care are frequently financial, but can also include low perceived need and attitudinal barriers [23, 24], and stigmas associated with mental illness [25]. In arthritis patients specifically, one study found that 42% of respondents did not obtain needed mental health services, citing financial issues, insurance coverage limits, and “lack of need” as the reason for not receiving a service [26]. Understanding barriers to mental health care among individuals with arthritis will help providers better identify those who may benefit from counseling or other treatment, and design interventions to address gaps in care delivery.



This analysis will build upon findings from previous studies by using data from the 2011-2013 National Health Interview Survey (NHIS) to accomplish the following objectives: 1) estimate the prevalence of SPD and other characteristics among US adults with self-reported arthritis compared to those without arthritis, 2) determine the distribution of relevant characteristics, such as sociodemographic variables and access to care, among the subset of individuals with arthritis and SPD, and 3) focusing on the subset of adults with both arthritis and SPD, use multivariable models to examine characteristics associated with receiving mental health care or not in the past year. It should be noted that the focus of this analysis is *not* to assess arthritis as a predictor of SPD when controlling for other variables, but rather to reveal characteristics amongst adults with arthritis and SPD that may help identify those in need of improved access to mental health treatment.

## **METHODS**

**Dataset.** The NHIS is an in-person household interview survey that is representative of the US civilian non-institutionalized population and is conducted by the Census Bureau interviewers continually throughout the year using a multistage, complex sampling design [27]. NHIS collects data on a broad range of health topics, including self-reported arthritis status and mental health conditions (depression, anxiety, stress, fatigue). In order to increase the available sample size, data from the 2011-2013 sample adult populations were pooled. The final analysis dataset included a total of 102,096 individuals.

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?*” Individuals were determined to have SPD, a non-specific indicator of mental health problems, using the standardized and validated Kessler 6 (K6) screening scale [28, 29].

K6 scores are comprised of 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.” The responses for each question range 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 13 or above are considered to have SPD [28].

Sociodemographic characteristics included age, sex, race, income-to-poverty ratio, education, employment, and marital status. Body Mass Index (BMI) was calculated for each individual using self-reported height and weight. Physical activity was assessed by whether individuals met the recommendations outlined in the 2008 Physical Activity Guidelines for Americans from the Center for Disease Control’s (CDC) Division of Nutrition, Physical Activity, and Obesity (DNPAO) [30]. The total number of comorbid conditions was determined by summing the presence of the following conditions: hypertension, cardiovascular condition (angina, myocardial infarction, coronary heart disease), stroke, respiratory condition (asthma, emphysema, chronic bronchitis), cancer, diabetes, weak or failing kidneys, liver condition, or ulcer [31].

Functional limitations were categorized from low to high according to an average score that was obtained from questions about an individual’s ability to perform nine activities (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) without special equipment. For each activity, responses range from 0 (not at all difficult) to 4 (can’t do at all). Social limitations, referred to as Social Participation Restriction [32], were determined using questions that assess how difficult it is to go out to events or participate in social activities without special equipment. Self-reported overall health was included.

Measures of health care access and utility included health insurance status, total number of doctor office visits in the past year, seeing a mental health professional in the past year (the outcome of the multivariable model), and being able to afford mental health care or counseling in the past year.

For a complete list of variables included in the analysis and their final categorization, see **Appendix A – Variable Definitions and Recodes**.

**Statistical analyses.** The prevalence of SPD and the other above-listed variables was estimated using sample adult weights and compared between the population with arthritis (N=24,954) and without arthritis (N=77,006). Differences in the distributions of characteristics between those with and without arthritis were assessed using the chi-square test and considered significant at  $\alpha=0.05$ . In the subgroup of adults with arthritis (n=24,954), the distribution of characteristics for those with SPD (N=1762) were compared to those without SPD (arthritis only, n=22,708).

Using the subset of adults with arthritis *and* SPD (N=1762), logistic regression (accounting for the complex survey design) was used to identify correlates of receiving mental health care in the past 12 months. Unadjusted odds ratios (ORs) were calculated for all covariates, and unadjusted associations that were significant at the  $\alpha=0.05$  level were considered for inclusion in a final multivariate model. All independent variables were assessed for multicollinearity using Pearson correlation matrices.

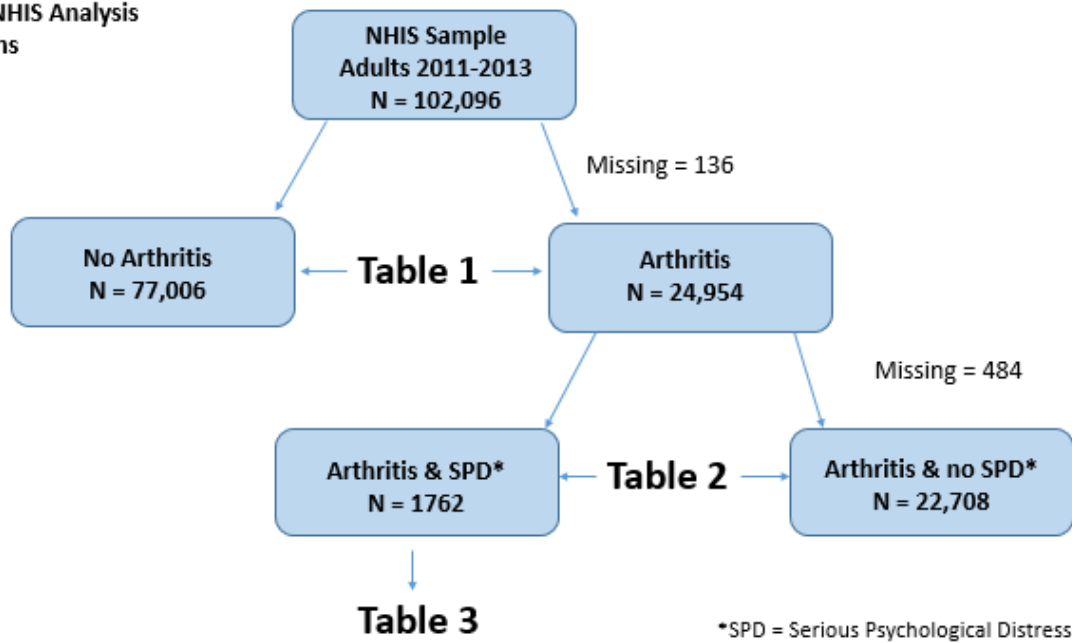
To build a final model, age, sex, and race were retained regardless of significance, and served as the basis of the main effects multivariable model. Other variables with statistically significant unadjusted ORs for receiving mental health care in the past year were added to the base model to determine whether they impacted the associations for other variables. The final model included variables that were still statistically significant when included in a model

together, as well as any non-significant variables that appeared to significantly impact the ORs of other covariates when excluded. Because it is feasible that insurance status could significantly affect whether someone is able to afford mental health care in the past year, the interaction between these two variables was assessed for inclusion in the final model.

**Figure 1** outlines the NHIS population subsets used for each of the above-described analyses.

All procedures were carried out using SAS 9.4 (Cary, NC).

**Figure 1. NHIS Analysis Populations**



## RESULTS

**Table 1** presents the prevalence of characteristics of the sample adult population stratified by arthritis status. Compared to the non-arthritis population, individuals with arthritis are older (38.3% aged 65+ vs. 11.7%), have a higher proportion of women (59.5% vs. 49.5%) and non-Hispanic whites (77.4% vs. 64.4%), and a lower proportion with college graduates (23.5% vs. 30.0%).

Consistent with the higher proportion of older individuals, the arthritis population also has a significantly higher proportion of individuals who are disabled (16.0% vs. 4.2%) and who have public-only health insurance (32.4% vs. 17.1%). Those with arthritis are less likely to have no insurance (8.5% vs. 19.5%). Individuals with arthritis more often report medium (18.0% vs. 3.5%) or high (18.4% vs. 2.5%) functional limitations, report poor/fair health (29.1% vs. 8.5%), and less meet the recommended physical activity levels for adults (37.8% vs. 52.7%).

The arthritis population has higher proportions of SPD (6.8% vs. 2.4%), depression in the past 12 months (19.4% vs. 7.3%), and report being frequently anxious in the past 12 months (29.3% vs. 16.3%). Compared to the adult population without arthritis, a higher proportion of the arthritis population saw a mental health professional in the past 12 months (11.1% vs. 6.7%).

**Table 2** presents the distribution of characteristics for the subgroup of adults with arthritis and SPD (n=1762) compared to adults with arthritis only (n=24,954). As a whole, individuals with arthritis and SPD are worse off than those with arthritis only. The subset of adults with arthritis and SPD has substantially higher proportions of individuals with less than a high school education (30.0% vs. 14.5%), work disability (54.1% vs. 13.1%), low income-to-

poverty ratio (36.9% vs. 11.7%), high level of functional limitations (53.9% vs. 15.5%), and social participation restriction (38.6% vs. 8.9%).

Adults with arthritis and SPD similarly report significantly higher levels of stress (93.1% vs. 34.3%) and fatigue (82.3% vs. 34.3%) in the past 12 months. Of those with SPD, over three quarters (77.2%) reported having depression in the past 12 months, compared with only 15.5% in the non-SPD group. Sixty-one percent of those with SPD did not see a mental health professional in the past 12 months. A higher percentage of individuals with SPD also reported not being able to afford mental health care in the past 12 months (22.2%) compared to those without SPD (2.2%), although this may be attributable to the assumption that the group with SPD more actively sought mental health treatment and encountered financial barriers, vs. the non-SPD group who may not have attempted. Those with SPD also are more likely to not have health insurance (17.4% vs. 7.9%).

**Table 3** reports the unadjusted and adjusted ORs for the association of each characteristic with seeing a mental health professional in the past year among the subset of adults with arthritis *and* SPD (n=1762) (i.e., higher ORs indicate increased odds of seeing a mental health progression). The unadjusted ORs indicate that the likelihood of seeing a mental health care provider decreased with age and increased with higher levels of education (OR for “less than high school” = 0.4, 95% CI=0.2-0.7). Those who identified as Asian were less likely to see a mental health care provider (OR=0.2, 95% CI=0.1-0.6) than those identified as other race categories. Individuals with only public insurance (vs. private; OR=1.4, 95% CI=1.0-1.9) and who are divorced/separated (OR=1.3, 95% CI=1.0-1.8) and never married (vs. married; OR=1.7, 95% CI=1.2-2.5) were somewhat more likely to see a mental health provider, while widowed individuals were less likely to (OR=0.6, 95% CI=0.4-0.9). Individuals with anxiety, depression, stress, feelings interfering with life, and poor/fair health perceptions were more likely to report

seeking mental health care in the past 12 months. Also, individuals who were unable to work due to disability (OR=2.0, 95% CI=1.4-2.9) or were unemployed (OR=1.9, 95% CI=1.1-3.3) (vs. employed) were more likely to have seen a mental health provider in the past year. Functional limitations, Social Participation Restriction, physical activity, sex, BMI, additional comorbid conditions, fatigue, income, and lacking health insurance were not associated with receiving mental health care in the past year. Interestingly, *not* being able to afford mental health care or counseling in the past 12 months was associated with seeing a mental health professional in the past year (OR=1.8 1.3-2.5).

**Table 3** also reports ORs from the final adjusted model. The final model included demographics (age, sex, race), education, insurance, employment, and ability to afford mental health care in the past year. Although the unadjusted ORs for anxiety, depression, stress, and fatigue were statistically significant, these variables could all be considered outcomes, exposures, or intervening variables of each other and SPD, and as such were excluded from the model. Further, these variables were only assessed in 2012 (this analysis combined years 2011-2013), and excluding single year variables allowed a larger sample size. The total number of office visits could also include mental health visits, so this was also excluded. Because education, employment, and insurance status could presumably be correlated with each other and contribute to whether an individual is able to receive mental health care, each of these variables were assessed in separate models with the demographics. Marital status was significant when considered by itself, but when included in a model with other significant variables it was no longer statistically significant, so was left out of the final model.

The interaction between insurance status and ability to afford mental health care in the past year was assessed and found to be non-significant. Inclusion of the interaction term in the model was not significant. Although the interaction term was not significant, the stratified odds

ratios did show some differences worthy of note. Stratifying by the ability to afford counseling, having public only health insurance (vs. private) was associated with seeing a mental health professional in the past year (OR=1.6, 95% CI=1.1-2.2) only for those who report being able to afford mental health care. For those unable to afford mental health care, having public only health insurance (vs. private) was not associated with seeing a mental health professional (OR=1.0, 95% CI=0.5-2.3). When stratifying by health insurance status, being unable to afford mental health care (vs. able to afford) was associated with receiving mental health care only among those with private health insurance (OR=2.3, 95% CI=1.2-4.3). Being unable to afford care was not associated with receiving care among those with public only insurance (OR=1.5, 95% CI=0.9-2.6) or no insurance (OR=1.8, 95% CI=0.9-3.5).

Compared to the unadjusted associations, the final adjusted associations for age, sex, race, education, and employment status all exhibit similar values for the association with seeing a mental health professional in the past year. The OR for being retired (compared to being employed) changed direction in the adjusted model, but was not statistically-significant. In the adjusted model, those without health insurance are less likely to have seen a mental health professional in the past year, and this relationship is significant (OR=0.5, 95% CI: 0.3-0.7), unlike in the unadjusted associations. *Not* being able to afford mental health care was still associated with seeing a mental health professional in the final model (OR=1.6, 95% CI=1.1-2.4).

**Table 3** includes the adjusted ORs for the final model only, and **Appendix B** includes the adjusted ORs for all other models that were assessed during the modeling process (including the stratified odds ratios associated with the interaction term).



## DISCUSSION

The totality of these findings suggest that: 1) there is a higher prevalence of SPD among those with arthritis compared to the population without arthritis, consistent with previous findings [4] (see **Table 1**); 2) Among the subset with arthritis and SPD, a large proportion report not receiving mental health care in the past year (60.8%), and are generally worse off than those with arthritis only (lower education, lower income, more disability, etc.; see **Table 2**); and, 3) among the subset of individuals with arthritis and SPD, being Asian, lacking health insurance, and having less education make it less likely to have seen a mental health professional in the past year when controlling for other variables (see **Table 3**). Income was not associated with seeing a mental health professional, an indication that health insurance or other non-financial barriers may play a larger role in receiving or not receiving care.

Overall these data suggest the need to increase the delivery of mental health services to the population with arthritis and SPD, and confirm findings from other studies that insurance coverage is an important barrier to care. Individuals with arthritis and SPD have characteristics that likely interfere with overall wellbeing and disease management (stress, fatigue, functional and social limitations, etc.) which may help providers identify individuals in need of mental health interventions to improve overall outcomes.

One seemingly counter-intuitive finding, among those with arthritis and SPD, *not* being able to afford mental health care or counseling in the past year was *also* associated with seeing a mental health professional (OR=1.6, 95% CI 1.1-2.4). This may indicate that although these individuals were able to see a mental health professional in the past year, they may not be getting the full extent of care they require. In the NHIS survey, the question assessing whether someone

could afford mental health care in the past year was worded as follows: “*During the past 12 months, was there **any time** [emphasis added] when you needed any of the following but didn’t get it because you couldn’t afford it? ...Mental health care or counseling.*” It is possible that some individuals with arthritis and SPD were able to receive counseling at some point during the year, but this was not adequate to fully address their needs and were limited due to financial or coverage obstacles. This would be consistent with findings from one study reporting that 26% of individuals with arthritis who had difficulty receiving mental health services cited “limits on the number of visits” as the reason for not obtaining care [26].

Although the interaction term between health insurance status and being able to afford mental health care in the past year was not significant, the stratified odds ratios offer some possible insight. Stratifying by ability to afford care, having public only health insurance (vs. private) was associated with seeing a mental health professional in the past year (OR=1.6, 95% CI=1.1-2.2, see **Appendix B**) *only for those who report being able to afford mental health care.* This may suggest variability in coverage levels for different kinds of public health insurance, or alternately, that some individuals with public-only insurance may not know that mental health treatment is covered (if it is) and as such do not seek it. Stratifying by health insurance status, among those with any private health insurance, those who were unable to afford mental health care had 2.3 times the odds of receiving care (95% CI=1.2-4.3) than those who reported being able to afford care. In comparison, being unable to afford care (vs. able to afford) did not reach significance for the association with receiving care among those with public only or no health insurance. This may again suggest that private plans allow individuals to access some mental health services, but there may be limits that prevent the full extent of care desired. These findings warrant further analyses to clarify how financial or coverage barriers prevent adequate treatment.

For the substantial proportion of individuals with arthritis and SPD who reported not seeing a mental health care professional in the past year (see **Table 2**), there may be other barriers unrelated to financial/health coverage reasons that may prevent them from seeking help. For example, stigmas about mental illness [25] or the belief that mental health problems can be overcome on their own [25, 26] may prevent some individuals from addressing the issue with providers. Lack of continuity of care has also been reported as a hindrance to establishing the comfort level needed for patients to introduce mental health concerns [25]. These barriers were not examined in NHIS and could provide further explanation for not receiving care.

The finding that Asians were less likely to see a mental health provider in the past year is consistent with other studies that found unmet mental health needs among Asian populations [33], which is possibly related to attitudinal barriers [34]. It should be noted, however, that the subset of Asians with arthritis and SPD in this analysis was very small (n=36), so this finding should be interpreted with some caution.

The outcome of interest for this analysis was whether someone received mental health care in the past year, but given the complex relationship between affording and accessing care, future analyses could alternately use “not being able to afford mental health care or counseling” as the outcome to identify correlates of not being able to afford care and further explore the relationships between affording and receiving mental health care.

Arthritis status was based on self-report which is less preferable than doctor-diagnosed cases, but this should be of minimal concern as there is generally high agreeability between self-report and physician-diagnosed chronic conditions [35]. It is possible that only the more severe cases of arthritis seek professional help and thereby the opportunity to receive a doctor diagnosis, so this analysis may be limited to those with slightly more severe disease. The response rate for the NHIS sample adult module was 81.6% for 2011, 79.7% for 2012, and 81.7% for 2013 [36].

Populations willing to participate in surveys can be different than those who refuse (may have more available time due to retirement, unemployment, disability, etc.) and as such older and unemployed populations may be over-represented. This analysis included the major variables related to whether someone saw a mental health professional in the past year, but there always could be other significant predictors that were not taken into account.

## **CONCLUSIONS**

Pain, disability, and mental health conditions interact in complicated ways to impact outcomes in individuals with comorbidities, and mental health treatment should be an important part of a multi-pronged approach to improving outcomes in this population. Because pharmacologic and cognitive-behavioral therapies can be successful for treating mental health conditions, and treatment for depression has been shown to improve outcomes for those with arthritis [21], others have suggested making screening for anxiety and depression in arthritis patients standard practice [37], particularly because patients may not bring up the subject on their own [25]. This analysis revealed certain populations who may experience gaps in adequate treatment (low education, lack of health insurance).

Health coverage and access to mental health services is a substantial and challenging policy issue, and even with improvements in identifying individuals who require mental health services, there may still be financial, attitudinal, or insurance coverage obstacles to receiving adequate care. This analysis also suggests that even if some mental health services are attained, there may be limits on coverage that prevent the full extent of needed care. If delivering adequate mental health services is an ongoing challenge, there may be other ways of improving both mental and physical health outcomes by better helping patients treat and manage pain, disability, or other functional or social limitations.

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**TABLE 1**  
**Prevalence of characteristics of adults with and without arthritis from the 2011-2013 National Health Interview Survey (NHIS)**

Characteristic	Arthritis (n=24,954)				No arthritis (n=77,006)				P-value**
	n	Pop N	Percent	95% CI	n	Pop N	Percent	95% CI	
<b>Age</b>									<0.0001
18-44	3,400	8,170,849	15.4 (14.7 – 16.0)		42,155	102,919,248	56.8 (56.2 – 57.4)		
45-64	10,717	24,623,477	46.3 (45.5 – 47.2)		23,727	57,009,489	31.5 (31.0 – 32.0)		
65+	10,837	20,370,277	38.3 (37.5 – 39.2)		11,124	21,179,441	11.7 (11.4 – 12.0)		
<b>Sex</b>									<0.0001
Female	15,714	31,634,448	59.5 (58.7 – 60.3)		40,778	89,603,842	49.5 (49.0 – 50.0)		
Male	9,240	21,530,154	40.5 (39.7 – 41.3)		36,228	91,504,337	50.5 (50.0 – 51.0)		
<b>Race</b>									<0.0001
White, non-Hispanic	17,397	41,155,953	77.4 (76.6 – 78.3)		43,899	116,642,142	64.4 (63.7 – 65.2)		
Black, non-Hispanic	4,014	5,954,650	11.2 (10.5 – 11.9)		11,579	21,896,551	12.1 (11.6 – 12.6)		
Hispanic	2,495	4,153,256	7.8 (7.3 – 8.3)		15,156	30,283,272	16.7 (16.1 – 17.3)		
Asian, non-Hispanic	758	1,387,323	2.6 (2.4 – 2.9)		5,595	10,800,993	6 (5.6 – 6.3)		
Other	290	513,421	1.0 (0.8 – 1.1)		777	1,485,221	0.8 (0.7 – 1.0)		
<b>Highest education</b>									<0.0001
Less than high school	4,693	8,344,724	15.7 (15.1 – 16.4)		11,559	24,337,323	13.5 (13.0 – 14.0)		
High school diploma	7,143	15,667,043	29.6 (28.7 – 30.4)		19,138	45,784,825	25.4 (24.9 – 25.9)		
Some college or Associates degree	7,593	16,513,931	31.2 (30.4 – 31.9)		23,482	56,091,437	31.1 (30.6 – 31.7)		
College or greater	5,429	12,460,940	23.5 (22.7 – 24.4)		22,441	53,973,729	30 (29.3 – 30.6)		
<b>Income to poverty ratio</b>									0.007
<1	4,207	6,569,511	13.6 (13.0 – 14.2)		13,251	23,443,782	14.1 (13.6 – 14.6)		
1 to <2	4,859	8,943,597	18.5 (17.8 – 19.2)		13,552	28,941,878	17.4 (17.0 – 17.8)		
>=2	13,515	32,802,096	67.9 (66.9 – 68.9)		44,006	114,042,947	68.5 (67.8 – 69.3)		
<b>Employment status</b>									<0.0001
Employed	9,049	21,327,098	40.1 (39.2 – 41.1)		49,767	120,018,819	66.3 (65.8 – 66.8)		
Retired	9,272	18,022,093	33.9 (33.0 – 34.8)		9,841	19,527,421	10.8 (10.5 – 11.1)		
Disabled	4,310	8,526,131	16.0 (15.4 – 16.7)		3,653	7,554,553	4.2 (4.0 – 4.4)		
Unemployed	921	1,942,326	3.7 (3.3 – 4.0)		5,100	12,438,530	6.9 (6.6 – 7.1)		
Volunteer/NILF	1,387	3,322,083	6.3 (5.8 – 6.7)		8,577	21,408,143	11.8 (11.5 – 12.2)		
<b>Marital status</b>									<0.0001
Married	10,722	30,342,533	57.2 (56.3 – 58.0)		33,437	93,725,613	51.8 (51.2 – 52.4)		
Widowed	4,902	7,229,188	13.6 (13.1 – 14.1)		4,726	6,855,932	3.8 (3.6 – 4.0)		
Divorced/separated	5,560	8,378,749	15.8 (15.2 – 16.3)		11,792	18,569,346	10.3 (10.0 – 10.5)		
Never married	2,813	4,649,196	8.8 (8.3 – 9.2)		21,567	47,016,303	26 (25.5 – 26.6)		
Living with partner	906	2,478,219	4.7 (4.3 – 5.0)		5,298	14,646,413	8.1 (7.8 – 8.4)		
<b>Body Mass Index (BMI)</b>									<0.0001
Under and normal weight (<25)	6,443	13,473,233	26.3 (25.6 – 27.0)		29,707	70,218,630	40.1 (39.6 – 40.6)		
Overweight (25 to <30)	8,200	17,669,603	34.5 (33.7 – 35.2)		25,753	60,551,964	34.6 (34.1 – 35.1)		
Obese (>=30)	9,429	20,104,654	39.2 (38.5 – 40.0)		18,954	44,257,318	25.3 (24.8 – 25.8)		
<b>Physical activity</b>									<0.0001
Meets recommendations	8,751	19,726,236	37.8 (36.9 – 38.8)		38,663	93,585,403	52.7 (52.0 – 53.3)		
Does not meet recommendations	15,723	32,412,021	62.2 (61.2 – 63.1)		36,965	84,132,548	47.3 (46.7 – 48.0)		
<b>Self-reported health</b>									<0.0001
Poor/fair	7,877	15,441,169	29.1 (28.2 – 29.9)		7,728	15,465,161	8.5 (8.3 – 8.8)		
Good	8,153	17,229,089	32.4 (31.7 – 33.2)		19,790	44,679,955	24.7 (24.2 – 25.1)		
Very good/excellent	8,908	20,457,418	38.5 (37.6 – 39.4)		49,459	120,884,210	66.8 (66.2 – 67.3)		

<b>Functional limitations</b>							<0.0001
None	6,135	14,237,960	26.9 (26.1 – 27.6)	57,803	139,253,230	77 (76.6 – 77.4)	
Low	8,733	19,475,939	36.7 (35.9 – 37.5)	13,634	30,816,900	17 (16.7 – 17.4)	
Medium	4,788	9,526,547	18.0 (17.4 – 18.6)	3,190	6,382,296	3.5 (3.4 – 3.7)	
High	5,222	9,776,518	18.4 (17.8 – 19.1)	2,288	4,437,558	2.5 (2.3 – 2.6)	
<b>Social Participation Restriction</b>							<0.0001
No	21,788	47,139,819	88.8 (88.3 – 89.4)	75,154	177,242,388	98 (97.8 – 98.1)	
Yes	3,118	5,928,778	11.2 (10.6 – 11.7)	1,773	3,665,576	2 (1.9 – 2.2)	
<b>Comorbid conditions†</b>							<0.0001
0	5,046	11,848,042	22.3 (21.6 – 23.0)	44,306	107,330,656	59.3 (58.8 – 59.8)	
1	7,189	15,656,314	29.5 (28.7 – 30.2)	20,233	46,934,640	25.9 (25.5 – 26.3)	
2	6,035	12,584,614	23.7 (23.0 – 24.4)	8,033	17,778,531	9.8 (9.5 – 10.1)	
3+	6,682	13,071,575	24.6 (23.9 – 25.2)	4,428	9,048,422	5 (4.8 – 5.2)	
<b>Serious Psychological Distress (SPD)</b>							<0.0001
No	22,708	48,642,050	93.2 (92.8 – 93.7)	73,699	173,791,379	97.6 (97.4 – 97.7)	
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>							<0.0001
Never	5,958	12,845,119	74.4 (73.2 – 75.6)	23,146	54,351,963	89.2 (88.7 – 89.7)	
In the past 12 months	1,718	3,342,369	19.4 (18.2 – 20.5)	2,126	4,453,828	7.3 (6.9 – 7.7)	
Ever, but not in past 12 months	546	1,078,144	6.2 (5.6 – 6.9)	967	2,116,356	3.5 (3.2 – 3.8)	
<b>Feelings interfered with life, past 30 days</b>							<0.0001
Not at all/a little	5,860	12,564,726	57.8 (56.6 – 59.1)	14,562	34,070,502	69.4 (68.6 – 70.2)	
Some/a lot	4,575	9,156,909	42.2 (40.9 – 43.4)	6,814	15,022,878	30.6 (29.8 – 31.4)	
<b>Frequently anxious, past 12 months*</b>							<0.0001
No	5,694	12,210,093	70.7 (69.5 – 71.9)	21,842	51,011,396	83.7 (83.1 – 84.3)	
Yes	2,531	5,058,347	29.3 (28.1 – 30.5)	4,403	9,926,523	16.3 (15.7 – 16.9)	
<b>Frequently stressed, past 12 months*</b>							<0.0001
No	5,068	10,692,819	62.0 (60.4 – 63.5)	19,279	44,870,212	73.6 (72.9 – 74.4)	
Yes	3,154	6,567,264	38.0 (36.5 – 39.6)	6,961	16,057,933	26.4 (25.6 – 27.1)	
<b>Had fatigue/lack of energy, past 12 months*</b>							<0.0001
No	5,755	12,104,592	70.1 (68.8 – 71.4)	23,178	54,077,286	88.7 (88.2 – 89.2)	
Yes	2,467	5,160,070	29.9 (28.6 – 31.2)	3,072	6,872,635	11.3 (10.8 – 11.8)	
<b>Health insurance</b>							<0.0001
Not covered	2,127	4,530,401	8.5 (8.1 – 9.0)	15,881	35,102,452	19.5 (19.0 – 20.0)	
Any private	13,476	31,327,148	59.1 (58.1 – 60.0)	45,504	114,509,388	63.5 (62.8 – 64.1)	
Public only	9,297	17,178,644	32.4 (31.5 – 33.2)	15,340	30,766,567	17.1 (16.6 – 17.5)	
<b>Total doctor office visits in the past year</b>							<0.0001
0	1,531	3,197,948	6.1 (5.7 – 6.5)	18,130	41,674,979	23.4 (22.9 – 23.9)	
1	2,147	4,695,763	9.0 (8.5 – 9.5)	14,909	35,945,588	20.1 (19.7 – 20.5)	
2 to 5	10,232	21,950,812	42.0 (41.1 – 42.8)	29,196	69,530,835	39 (38.5 – 39.4)	
6 to 12	6,793	14,138,479	27.0 (26.3 – 27.8)	9,503	21,775,771	12.2 (11.9 – 12.5)	
13+	3,801	8,304,815	15.9 (15.3 – 16.5)	4,144	9,484,467	5.3 (5.1 – 5.5)	
<b>Seen a mental health professional in the past 12 months</b>							<0.0001
No	21,820	46,693,182	88.9 (88.4 – 89.4)	70,777	167,055,947	93.3 (93.0 – 93.5)	
Yes	2,828	5,837,892	11.1 (10.6 – 11.6)	5,420	12,089,321	6.7 (6.5 – 7.0)	
<b>Couldn't afford mental health counseling in the past year</b>							<0.0001
No	23,834	50,795,980	96.4 (96.1 – 96.8)	74,548	175,669,158	97.8 (97.7 – 97.9)	
Yes	884	1,873,646	3.6 (3.2 – 3.9)	1,841	3,924,683	2.2 (2.1 – 2.3)	

\*Sample sizes are lower because variable was only assessed in the 2012 NHIS

\*\*Chi-square test



**TABLE 2**

**Characteristics of adults with arthritis and Serious Psychological Distress (SPD) compared to adults with arthritis and no SPD from the 2011-2013 National Health Interview Survey (NHIS)**

Characteristic	Arthritis and SPD (n=1762)			Arthritis without SPD (n=22,708)			P-value**
	Sample n	%	(95% CI)	Sample n	%	(95% CI)	
<b>Age</b>							<0.0001
18-44	365	23.8	(21.0 – 26.5)	2985	14.8	(14.1 – 15.5)	
45-64	1,002	56.7	(53.5 – 59.8)	9544	45.8	(44.9 – 46.7)	
≥65	395	19.5	(17.1 – 21.9)	10179	39.4	(38.5 – 40.2)	
<b>Sex</b>							0.005
Male	565	36.3	(33.4 – 39.2)	8497	40.8	(40.0 – 41.7)	
Female	1,197	63.7	(60.8 – 66.6)	14211	59.2	(58.3 – 60.0)	
<b>Race/ethnicity</b>							<0.0001
White, non-Hispanic	1,135	73.7	(71.0 – 76.5)	15959	77.8	(77.0 – 78.7)	
Black, non-Hispanic	276	11.5	(9.6 – 13.3)	3647	11.1	(10.4 – 11.8)	
Hispanic	282	11.6	(9.8 – 13.4)	2164	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>							<0.0001
Less than high school	577	30.0	(27.3 – 32.6)	3972	14.5	(13.9 – 15.1)	
High school diploma	525	32.2	(29.1 – 35.3)	6494	29.4	(28.5 – 30.3)	
Some college or Associates degree	517	30.1	(27.1 – 33.1)	6951	31.4	(30.6 – 32.2)	
College or greater	135	7.7	(6.2 – 9.2)	5213	24.8	(23.9 – 25.7)	
<b>Income-to-poverty ratio</b>							<0.0001
<1	731	36.9	(33.6 – 40.1)	3361	11.7	(11.2 – 12.2)	
1 to <2	474	27.9	(25.3 – 30.6)	4293	17.7	(17.0 – 18.4)	
≥ 2	459	35.2	(31.9 – 38.5)	12892	70.6	(69.7 – 71.6)	
<b>Employment/work status</b>							<0.0001
Employed	314	18.1	(15.7 – 20.5)	8622	42.0	(41.1 – 43.0)	
Retired	257	14.3	(12.1 – 16.5)	8807	35.2	(34.3 – 36.1)	
Disabled	943	54.1	(50.7 – 57.5)	3247	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)	1247	6.2	(5.8 – 6.7)	
<b>Marital status</b>							<0.0001
Married	530	41.5	(38.3 – 44.8)	10035	58.6	(57.7 – 59.5)	
Widowed	257	11.2	(9.4 – 13.0)	4517	13.6	(13.1 – 14.1)	
Divorced/separated	604	26.8	(24.1 – 29.5)	4845	15.0	(14.4 – 15.5)	
Never married	269	12.6	(10.8 – 14.4)	2473	8.4	(7.9 – 8.8)	
Living with partner	98	7.9	(6.0 – 9.7)	795	4.5	(4.1 – 4.8)	
<b>Body Mass Index (BMI)</b>							<0.0001
Under and normal weight (<25)	476	28.3	(25.5 – 31.2)	5847	26.0	(25.2 – 26.8)	
Overweight (25 to < 30)	470	27.3	(24.8 – 29.9)	7608	35.1	(34.3 – 35.9)	
Obese (≥ 30)	771	44.4	(41.4 – 47.4)	8521	38.9	(38.1 – 39.7)	
<b>Physical activity</b>							<0.0001
Does not meet recommendations	1,428	82.5	(80.3 – 84.7)	13963	60.4	(59.4 – 61.4)	
Meets recommendations	304	17.5	(15.3 – 19.7)	8356	39.6	(38.6 – 40.6)	
<b>Self-reported health</b>							<0.0001
Poor/fair	1,287	72.1	(69.4 – 74.8)	6351	25.5	(24.7 – 26.3)	
Good	338	19.5	(17.2 – 21.8)	7685	33.5	(32.7 – 34.3)	
Very good/excellent	136	8.4	(6.7 – 10.0)	8658	41.0	(40.1 – 41.9)	
<b>Functional limitations</b>							<0.0001
None	89	5.5	(4.1 – 7.0)	5969	28.6	(27.8 – 29.4)	
Low	271	17.3	(14.8 – 19.8)	8347	38.4	(37.5 – 39.2)	
Medium	433	23.3	(20.5 – 26.1)	4250	17.5	(16.9 – 18.1)	
High	964	53.9	(50.3 – 57.4)	4097	15.5	(15.0 – 16.1)	

<b>Social Participation Restriction</b>							
No	1,080	61.4	(58.0 – 64.7)	20359	91.1	(90.7 – 91.6)	<0.0001
Yes	680	38.6	(35.3 – 42.0)	2327	8.9	(8.4 – 9.3)	
<b>Comorbid condition count</b>							
0	192	12.2	(10.2 – 14.2)	4768	23.1	(22.4 – 23.8)	<0.0001
1	342	20.6	(18.1 – 23.1)	6712	30.1	(29.4 – 30.9)	
2	407	23.0	(20.5 – 25.5)	5522	23.8	(23.1 – 24.5)	
3+	820	44.2	(41.1 – 47.4)	5706	23.0	(22.3 – 23.6)	
<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>Feelings interfered with life, past 30 days</b>							
Not at all/A little	201	11.1	(9.1 – 13.1)	5624	67.2	(66.0 – 68.4)	<0.0001
Some/A lot	1,559	88.9	(86.9 – 90.9)	2965	32.8	(31.6 – 34.0)	
<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)	4995	65.7	(64.1 – 67.2)	<0.0001
Yes	477	93.1	(89.1 – 97.1)	2638	34.3	(32.8 – 35.9)	
<b>Had fatigue/lack of energy, past 12 months*</b>							
No	100	17.7	(13.0 – 22.5)	5612	73.7	(72.4 – 75.0)	<0.0001
Yes	414	82.3	(77.5 – 87.0)	2019	26.3	(25.0 – 27.6)	
<b>Health insurance</b>							
Any private	473	30.5	(27.6 – 33.5)	12813	61.5	(60.5 – 62.4)	<0.0001
Public only	993	52.0	(48.9 – 55.2)	8050	30.6	(29.8 – 31.5)	
Not covered	290	17.4	(15.1 – 19.7)	1800	7.9	(7.4 – 8.4)	
<b>Number of office visits past 12 months</b>							
0	115	6.3	(4.9 – 7.7)	1390	6.1	(5.7 – 6.5)	<0.0001
1	81	4.3	(3.1 – 5.4)	2045	9.4	(8.8 – 9.9)	
2 to 5	432	24.0	(21.5 – 26.5)	9678	43.4	(42.5 – 44.3)	
6 to 12	531	30.6	(27.6 – 33.6)	6164	26.8	(26.0 – 27.6)	
13+	568	34.8	(31.7 – 37.9)	3163	14.4	(13.8 – 15.0)	
<b>Seen a mental health professional in the past 12 months</b>							
No	1,058	60.8	(57.6 – 64.0)	20449	91.0	(90.5 – 91.4)	<0.0001
Yes	681	39.2	(36.0 – 42.4)	2093	9.0	(8.6 – 9.5)	
<b>Couldn't afford mental health care, past 12 months</b>							
No	1,389	77.8	(75.2 – 80.5)	22070	97.8	(97.6 – 98.1)	<0.0001
Yes	360	22.2	(19.5 – 24.8)	504	2.2	(1.9 – 2.4)	

\*Sample sizes are lower because variable was only assessed in the 2012 NHIS

\*\*Chi-square test

**TABLE 3**

Unadjusted and adjusted associations of characteristics with seeing a mental health professional in the past 12 months among adults with arthritis and Serious Psychological Distress (SPD) from the 2011-2013 National Health Interview Survey (NHIS)

Characteristic	Unadjusted			Adjusted (Final Model) (n=1727)		
	OR**	95% C.I.	P-value <sup>a</sup>	OR**	95% C.I.	P-value <sup>a</sup>
<b>Age (n=1739)</b>			<0.0001			<0.0001
18-44	4.1	(2.6 – 6.3)		4.5	(2.6 – 7.7)	
45-64	3.0	(2.1 – 4.3)		2.7	(1.7 – 4.3)	
≥65		1.0			1.0	
<b>Sex (n=1739)</b>			0.78			0.40
Male		1.0			1.0	
Female	1.0	(0.8 – 1.4)		1.2	(0.8 – 1.6)	
<b>Race/ethnicity (n=1739)</b>			0.06			0.06
White, non-Hispanic		1.0			1.0	
Black, non-Hispanic	0.9	(0.6 – 1.2)		0.7	(0.5 – 1.1)	
Hispanic	0.8	(0.6 – 1.2)		1.1	(0.8 – 1.5)	
Asian, non-Hispanic	0.2	(0.1 – 0.6)		0.2	(0.0 – 0.8)	
Other	1.0	(0.4 – 2.2)		0.8	(0.3 – 2.1)	
<b>Highest education (n=1732)</b>			<0.0001			<0.0001
Less than high school	0.4	(0.2 – 0.7)		0.3	(0.2 – 0.5)	
High school diploma	0.6	(0.4 – 1.0)		0.5	(0.3 – 0.8)	
Some college or Associates degree	0.9	(0.5 – 1.4)		0.6	(0.4 – 1.1)	
College or greater		1.0			1.0	
<b>Income-to-poverty ratio (n=1643)</b>			0.99			
<1	1.0	(0.7 – 1.4)				
1 to <2	1.0	(0.7 – 1.4)				
≥ 2		1.0				
<b>Employment status (n=1739)</b>			<0.0001			<0.0001
Employed		1.0			1.0	
Retired	0.6	(0.4 – 1.0)		1.6	(0.9 – 2.8)	
Disabled	2.0	(1.4 – 2.9)		2.4	(1.6 – 3.5)	
Unemployed	1.9	(1.1 – 3.3)		2.1	(1.2 – 3.7)	
Volunteer/NILF	0.7	(0.4 – 1.4)		0.7	(0.4 – 1.4)	
<b>Marital status (n=1735)</b>			<0.001			
Married		1.0				
Widowed	0.6	(0.4 – 0.9)				
Divorced/separated	1.3	(1.0 – 1.8)				
Never married	1.7	(1.2 – 2.5)				
Living with partner	1.1	(0.6 – 1.8)				
<b>Body Mass Index (BMI) (n=1702)</b>			0.58			
Under and normal weight (<25)		1.0				
Overweight (25 to < 30)	1.0	(0.7 – 1.3)				
Obese (≥ 30)	1.1	(0.8 – 1.5)				
<b>Physical activity (n=1717)</b>			0.56			
Meets recommendations	1.1	(0.8 – 1.6)				
Does not meet recommendations		1.0				
<b>Health perceptions (n=1738)</b>			0.04			
Poor/fair	1.6	(1.0 – 2.5)				
Good	1.2	(0.7 – 2.1)				
Very good/excellent		1.0				
<b>Functional limitations (n=1736)</b>			0.12			
None		1.0				
Low	0.6	(0.3 – 1.2)				
Medium	1.0	(0.5 – 1.8)				
High	0.8	(0.5 – 1.5)				

<b>Social Participation Restriction (n=1739)</b>						
No		1.0				0.96
Yes	1.0	(0.8 – 1.3)				
<b>Comorbid condition count (n=1738)</b>						0.67
0		1.0				
1	1.0	(0.6 – 1.6)				
2	0.8	(0.5 – 1.3)				
3+	0.9	(0.6 – 1.3)				
<b>Depression* (n=501)</b>						<0.0001
Never		1.0				
In the past 12 months	4.3	(2.0 – 9.0)				
Ever, but not in past 12 months	0.9	(0.2 – 3.3)				
<b>Feelings interfered with life (n=1737)</b>						<0.0001
Not at all/A little		1.0				
Some/A lot	3.4	(2.0 – 5.7)				
<b>Frequently anxious, past 12 months* (n=501)</b>						<0.001
No		1.0				
Yes	6.0	(2.4 – 15.0)				
<b>Frequently stressed, past 12 months * (n=501)</b>						<0.001
No		1.0				
Yes	11.2	(3.5 – 35.6)				
<b>Had fatigue/lack of energy, past 12 months* (n=501)</b>						0.15
No		1.0				
Yes	1.6	(0.8 – 3.1)				
<b>Health insurance (N=1733)</b>						<0.01
Any private		1.0		1.0		<0.0001
Public only	1.4	(1.0 – 1.9)		1.3	(0.9 – 1.8)	
Not covered	0.7	(0.5 – 1.1)		0.5	(0.3 – 0.7)	
<b>Number of office visits past 12 months (n=1722)</b>						<0.0001
0		1.0				
1	1.3	(0.5 – 3.3)				
2 to 5	3.2	(1.8 – 5.7)				
6 to 12	3.8	(2.1 – 6.7)				
13+	7.7	(4.3 – 13.8)				
<b>Couldn't afford mental health care, past 12 months (n=1739)</b>						<0.001
No		1.0		1.0		0.02
Yes	1.8	(1.3 – 2.5)		1.6	(1.1 – 2.4)	

\*Sample sizes are lower because variable was only assessed in the 2012 NHIS

\*\*OR=odds ratio

°Wald Chi-Square

## APPENDIX A: Variable Definitions and Recodes

NHIS Variable Name	New Variable Name	Description	Original Values	New Values
PSU_P	PSU_P	Pseudo-PSU for public use file variance estimation	1 - 2	NA
STRAT_P	STRAT_P	Pseudo-stratum for public use file variance estimation	1 - 300	NA
AGE_P	AGE_N	age in years	0 - 85	NA
SEX	SEX_N	sex	1 Male 2 Female	1 Male 2 Female
ARTH1	ARTH1_N	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?	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
ANXNWYR	ANXFREQ_N	Frequently anxious, past 12 months	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
ASTRESYR	STRESFREQ_N	Frequently stressed, past 12 months	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
ADEPRSEV	DEPREV_N	Ever told you have depression	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
ADEPRSYR	DEPRYR_N	Had depression, past 12 months	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
FATIGYR	FATIGUE_N	Had fatigue/lack of energy, past 12 months	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
SAD	SAD_R (part of SPD_N)	So sad nothing cheers you up, past 30 days	1 ALL of the time 2 MOST of the time 3 SOME of the time 4 A LITTLE of the time 5 NONE of the time 7 Refused 8 Not ascertained 9 Don't know	For SPD_N: 0 No 1 Yes
NERVOUS	NERVOUS_R (part of SPD_N)	How often felt nervous, past 30 days	1 ALL of the time 2 MOST of the time 3 SOME of the time 4 A LITTLE of the time 5 NONE of the time 7 Refused 8 Not ascertained 9 Don't know	For SPD_N: 0 No 1 Yes
RESTLESS	RESTLESS_R (part of SPD_N)	How often restless/fidgety, past 30 days	1 ALL of the time 2 MOST of the time 3 SOME of the time 4 A LITTLE of the time 5 NONE of the time 7 Refused 8 Not ascertained 9 Don't know	For SPD_N: 0 No 1 Yes

HOPELESS	HOPELESS_R (part of SPD_N)	How often felt hopeless, past 30 days	1 ALL of the time 2 MOST of the time 3 SOME of the time 4 A LITTLE of the 5 NONE of the time 7 Refused 8 Not ascertained 9 Don't know	For SPD_N: 0 No 1 Yes
EFFORT	EFFORT_R (part of SPD_N)	How often felt everything was an effort, past 30 days	1 ALL of the time 2 MOST of the time 3 SOME of the time 4 A LITTLE of the 5 NONE of the time 7 Refused 8 Not ascertained 9 Don't know	For SPD_N: 0 No 1 Yes
WORTHLS	WORTHLS_R (part of SPD_N)	How often felt worthless, past 30 days	1 ALL of the time 2 MOST of the time 3 SOME of the time 4 A LITTLE of the 5 NONE of the time 7 Refused 8 Not ascertained 9 Don't know	For SPD_N: 0 No 1 Yes
MHAMTMO		Feelings interfered w/life, past 30 days	1 A lot 2 Some 3 A little 4 Not at all 7 Refused 8 Not ascertained 9 Don't know	
AHCAFYR2	COUNSEL_N	Couldn't afford mental health care/counseling, past 12 months	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
AHCSYR1	MHPROF_N	Seen/talked to mental health professional, past 12 months	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes
AHCNOYR2	OFFTOT_N	Total number of office visits, past 12 m	00 None 01 1 02 2-3 03 4-5 04 6-7 05 8-9 06 10-12 07 13-15 08 16 or more 97 Refused 98 Not ascertained 99 Don't know	0: 0 1: 1 2: 2-5 3: 6-12 4: 13+
NOTCOV	part of INSUR_N	NHIS sample adult: no health insurance	1 Not covered 2 Covered 7 Refused 8 Not ascertained 9 Don't know	For INSUR_N: 1 Not covered 2 Any private 3 Public only
PRIVATE	part of INSUR_N	NHIS sample adult: private insurance	1 Yes, information 2 Yes, but no information 3 No 7 Refused 8 Not ascertained 9 Don't know	For INSUR_N: 1 Not covered 2 Any private 3 Public only

HISCODI3	RACE_N	Race/ethnicity	1 Hispanic 2 Non-Hispanic White 3 Non-Hispanic Black 4 Non-Hispanic Asian 5 Non-Hispanic All other race groups	1 White, non-Hispanic 2 Black, non-Hispanic 3 Hispanic 4 Asian, non-Hispanic 5 Other
EDUC1	EDUC1_N	highest level of education	00 Never attended/kindergarten only 01 1st grade 02 2nd grade 03 3rd grade 04 4th grade 05 5th grade 06 6th grade 07 7th grade 08 8th grade 09 9th grade 10 10th grade 11 11th grade 12 12th grade, no diploma 13 GED or equivalent 14 High School Graduate 15 Some college, no degree 16 Associate degree: occupational, technical, or vocational program 17 Associate degree: academic program 18 Bachelor's degree (Example: BA, AB, BS, BBA) 19 Master's degree (Example: MA, MS, MEng, MEd, MBA) 20 Professional School degree (Example: MD, DDS, DVM, JD) 21 Doctoral degree (Example: PhD, EdD) 96 Child under 5 years old 97 Refused 98 Not ascertained 99 Don't know	1 Less than high school 2 High school diploma and some college 3 Completed college or greater
	COMORB_N			0: 0 1: 1 2: 2 3: 3+
HYPEV	HYPEV_N (part of COMORB_N)	EVER been told by a doctor had Hypertension	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
CHDEV	HEARTDIS_N (part of COMORB_N)	EVER been told by a doctor had CHD	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
ANGEV	HEARTDIS_N (part of COMORB_N)	EVER been told by a doctor had angina	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
MIEV	HEARTDIS_N (part of COMORB_N)	EVER been told by a doctor had heart attack	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+

HRTEV	HEARTDIS_N (part of COMORB_N)	EVER been told by a doctor had any other heart disease	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
STREV	STREV_N (part of COMORB_N)	EVER been told by a doctor had a stroke	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
EPHEV	PULMCOND_N (part of COMORB_N)	EVER been told by a doctor had emphysema	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
AASMEV	PULMCOND_N (part of COMORB_N)	EVER been told by a doctor had asthma	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
ULCEV	ULCEV_N (part of COMORB_N)	EVER been told by a doctor had an ulcer	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
CANEV	CANEV_N (part of COMORB_N)	EVER been told by a doctor had cancer	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
DIBEV	DIBEV_N (part of COMORB_N)	EVER been told by a doctor had diabetes	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
CBRCHYR	PULMCOND_N (part of COMORB_N)	Told by a doctor had chronic bronchitis past 12 mo	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
KIDWKYR	KIDWKYR_N (part of COMORB_N)	PAST 12 MONTHS told by doctor had weak or failing kidneys	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
LIVYR	LIVYR_N (part of COMORB_N)	PAST 12 MONTHS told by doctor had liver condition	1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know	For COMORB_N: 0: 0 1: 1 2: 2 3: 3+
BMI	BMI_N	Body Mass Index (BMI); calculated using in-house version of height and weight variables; BMI=[weight(kg)/height(m <sup>2</sup> )] rounded to two decimal places	0001-9994 00.01-99.94 9995 99.5+ 9999 Unknown	1 Under and normal weight (<25) 2 Overweight (25 to <30) 3 Obese (>=30)
R_MARITL	MARITAL_N	Now married, widowed, divorced, separated, never married, or living with a partner	0 Under 14 years 1 Married - spouse in household 2 Married - spouse not in household 3 Married - spouse in household unknown 4 Widowed 5 Divorced 6 Separated 7 Never married 8 Living with partner 9 Unknown marital status	1 Married 2 Widowed 3 Divorced/separated 4 Never married 5 Living with partner



RAT_CAT2	INCOME_N	Ratio of family income to the poverty threshold	01 Under 0.50 02 0.50-0.74 03 0.75-0.99 04 1.00-1.24 05 1.25-1.49 06 1.50-1.74 07 1.75-1.99 08 2.00-2.49 09 2.50-2.99 10 3.00-3.49 11 3.50-3.99 12 4.00-4.49 13 4.50-4.99 14 5.00 and over 15 Less than 1.00 (no further detail) 16 1.00-1.99 (no further detail) 17 2.00 and over (no further detail) 96 Undefined 99 Unknown	1: <1 2: 1 to <2 3: >=2
DOINGLWA	Part of EMPLOY_N	Corrected employment status last week	1 Working for pay at a job or business 2 With a job or business but not at work 3 Looking for work 4 Working, but not for pay, at a family-owned job or business 5 not working at a job or business and not looking for work 7 Refused 8 Not ascertained 9 Don't know	For EMPLOY_N: 1 Employed 2 Retired 3 Disabled 4 Unemployed 5 Volunteer/NILF
WHYNOWKA	Part of EMPLOY_N	Main reason did not work last week	01 Taking care of house or family 02 Going to school 03 Retired 04 On a planned vacation from work 05 On family or maternity leave 06 Temporarily unable to work for health reasons 07 Have job/contract and off-season 08 On layoff 09 Disabled 10 Other 97 Refused 98 Not ascertained 99 Don't know	For EMPLOY_N: 1 Employed 2 Retired 3 Disabled 4 Unemployed 5 Volunteer/NILF
FLWALK	Part of FUNCLIM_N	How difficult to walk 1/4 mile without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
FLCLIMB	Part of FUNCLIM_N	How difficult to climb 10 steps without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High

FLSTAND	Part of FUNCLIM_N	How difficult to stand 2 hours without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
FLSIT	Part of FUNCLIM_N	How difficult to sit 2 hours without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
FLSTOOP	Part of FUNCLIM_N	How difficult to stoop, bend, or kneel without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
FLREACH	Part of FUNCLIM_N	How difficult to reach over head without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
FLGRASP	Part of FUNCLIM_N	How difficult to grasp small objects without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
FLCARRY	Part of FUNCLIM_N	How difficult to lift/carry 10 lbs without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
FLPUSH	Part of FUNCLIM_N	How difficult to push large objects without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For FUNCLIM_N: 1 None 2 Low 3 Medium 4 High
AFLHC33_	FATIGUE_N	Fatigue/tiredness/weakness causes difficulty with activity	1 Mentioned 2 Not mentioned 7 Refused 8 Not ascertained 9 Don't know	0 No 1 Yes

PHSTAT	HPERCEP_N	Reported health status	1 Excellent 2 Very good 3 Good 4 Fair 5 Poor 7 Refused 8 Not ascertained 9 Don't know	1 Poor/fair 2 Good 3 Very good/excellent
FLSHOP	SHOPLIM (part of SOCREST)	How difficult to go out to events without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For SOCREST: 0 No 1 Yes
FLSOCL	SOCLIM (part o SOCREST)	How difficult to participate in social activities without special equipment	0 Not at all difficult 1 Only a little difficult 2 Somewhat difficult 3 Very difficult 4 Can't do at all 6 Do not do this activity 7 Refused 8 Not ascertained 9 Don't know	For SOCREST: 0 No 1 Yes
	PHYSACT_N			0 No 1 Yes
MODFREQW	part of PHYSACT_N	Freq light/moderate activity (time per wk)	00 Less than once per week 01-28 1-28 times per week 95 Never 96 Unable to do vigorous activity 97 Refused 98 Not ascertained 99 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations
MODMIN	part of PHYSACT_N	Duration light/moderate activity (in minues)	010-720 10-720 minutes 997 Refused 998 Not ascertained 999 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations
MODNO	part of PHYSACT_N	Freq moderate activity: # of units	000 Never 001-995 1-995 time(s) 996 Unable to do this type activity 997 Refused 998 Not ascertained 999 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations
MODTP	part of PHYSACT_N	Freq moderate activity: time units	0 Never 1 Per day 2 Per week 3 Per month 4 per year 6 Unable to do this activity 7 Refused 8 Not ascertained 9 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations
VIGFREQW	part of PHYSACT_N	Freq vigorous activity (times per week)	00 Less than once per week 01-28 1-28 times per week 95 Never 96 Unable to do vigorous activity 97 Refused 98 Not ascertained 99 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations
VIGMIN	part of PHYSACT_N	Duration vigorous activity (in minutes)	010-720 10-720 minutes 997 Refused 998 Not ascertained 999 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations
VIGNO	part of PHYSACT_N	Freq vigorous activity: # of units	000 Never 001-995 1-995 time(s) 996 Unable to do this type activity 997 Refused 998 Not ascertained 999 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations

VIGTP	part of PHYSACT_N	Freq vigorous activity: time unites	0 Never 1 Per day 2 Per week 3 Per month 4 per year 6 Unable to do this activity 7 Refused 8 Not ascertained 9 Don't know	For PHYSACT_N: 0 Does not meet recommendations 1 Meets recommendations
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## **APPENDIX B: Other Models**

**Unadjusted and adjusted associations with seeing a mental health professional in the past 12 months among adults with arthritis and Serious Psychological Distress (SPD) from the 2011-2013 National Health Interview Survey (NHIS) – OTHER MODELS**

Characteristic	Unadjusted		Adjusted Model 1 all variables		Adjusted Model 2 age, sex, race	
	OR**	95% C.I.	OR**	95% C.I.	OR**	95% C.I.
<b>Age</b>						
18-44	4.1	(2.6 – 6.3)	4.1	(2.3 – 7.4)	4.1	(2.6 – 6.4)
45-64	3.0	(2.1 – 4.3)	2.6	(1.6 – 4.2)	3.0	(2.1 – 4.3)
≥65		1.0		1.0		1.0
<b>Sex</b>						
Male		1.0		1.0		1.0
Female	1.0	(0.8 – 1.4)	1.1	(0.8 – 1.6)	1.1	(0.8 – 1.5)
<b>Race/ethnicity</b>						
White, non-Hispanic		1.0		1.0		1.0
Black, non-Hispanic	0.9	(0.6 – 1.2)	0.7	(0.4 – 1.0)	0.8	(0.6 – 1.1)
Hispanic	0.8	(0.6 – 1.2)	1.1	(0.7 – 1.5)	0.9	(0.6 – 1.2)
Asian, non-Hispanic	0.2	(0.1 – 0.6)	0.2	(0.1 – 0.8)	0.2	(0.1 – 0.8)
Other	1.0	(0.4 – 2.2)	0.9	(0.3 – 2.1)	0.9	(0.4 – 2.0)
<b>Highest education</b>						
Less than high school	0.4	(0.2 – 0.7)	0.3	(0.2 – 0.5)		
High school diploma	0.6	(0.4 – 1.0)	0.5	(0.3 – 0.8)		
Some college or Associates degree	0.9	(0.5 – 1.4)	0.7	(0.4 – 1.2)		
College or greater		1.0		1.0		
<b>Employment status</b>						
Employed		1.0		1.0		
Retired	0.6	(0.4 – 1.0)	1.6	(0.9 – 3.0)		
Disabled	2.0	(1.4 – 2.9)	2.4	(1.6 – 3.5)		
Unemployed	1.9	(1.1 – 3.3)	2.1	(1.2 – 3.6)		
Volunteer/NILF	0.7	(0.4 – 1.4)	0.7	(0.4 – 1.5)		
<b>Marital status</b>						
Married		1.0		1.0		
Widowed	0.6	(0.4 – 0.9)	0.9	(0.6 – 1.5)		
Divorced/separated	1.3	(1.0 – 1.8)	1.2	(0.9 – 1.7)		
Never married	1.7	(1.2 – 2.5)	1.5	(0.9 – 2.3)		
Living with partner	1.1	(0.6 – 1.8)	0.9	(0.5 – 1.7)		
<b>Health insurance</b>						
Any private		1.0		1.0		
Public only	1.4	(1.0 – 1.9)	1.2	(0.8 – 1.8)		
Not covered	0.7	(0.5 – 1.1)	0.5	(0.3 – 0.7)		
<b>Number of office visits past 12 months</b>						
0		1.0				
1	1.3	(0.5 – 3.3)				
2 to 5	3.2	(1.8 – 5.7)				
6 to 12	3.8	(2.1 – 6.7)				
13+	7.7	(4.3 – 13.8)				
<b>Couldn't afford mental health care, past 12 months</b>						
No		1.0		1.0		
Yes	1.8	(1.3 – 2.5)	1.7	(1.1 – 2.5)		

\*Only assessed in the 2012 NHIS survey

\*\*OR=odds ratio

Characteristic	Unadjusted		Adjusted Model 3		
	OR**	95% C.I.	Demographics + insurance + counsel_N + insurance*COUNSEL_N		
			OR**	95% C.I.	
<b>Age</b>					
18-44	4.1	(2.6 – 6.3)	4.4		(2.8 – 7.0)
45-64	3.0	(2.1 – 4.3)	3.2		(2.2 – 4.7)
≥65		1.0		1.0	
<b>Sex</b>					
Male		1.0		1.0	
Female	1.0	(0.8 – 1.4)	1.1		(0.8 – 1.5)
<b>Race/ethnicity</b>					
White, non-Hispanic		1.0		1.0	
Black, non-Hispanic	0.9	(0.6 – 1.2)	0.8		(0.5 – 1.1)
Hispanic	0.8	(0.6 – 1.2)	0.9		(0.6 – 1.2)
Asian, non-Hispanic	0.2	(0.1 – 0.6)	0.3		(0.1 – 0.8)
Other	1.0	(0.4 – 2.2)	0.9		(0.4 – 2.0)
<b>Highest education</b>					
Less than high school	0.4	(0.2 – 0.7)			
High school diploma	0.6	(0.4 – 1.0)			
Some college or Associates degree	0.9	(0.5 – 1.4)			
College or greater		1.0			
<b>Employment status</b>					
Employed		1.0			
Retired	0.6	(0.4 – 1.0)			
Disabled	2.0	(1.4 – 2.9)			
Unemployed	1.9	(1.1 – 3.3)			
Volunteer/NILF	0.7	(0.4 – 1.4)			
<b>Marital status</b>					
Married		1.0			
Widowed	0.6	(0.4 – 0.9)			
Divorced/separated	1.3	(1.0 – 1.8)			
Never married	1.7	(1.2 – 2.5)			
Living with partner	1.1	(0.6 – 1.8)			
<b>Health insurance</b>					
Any private		1.0		1.0	
Public only	1.4	(1.0 – 1.9)	<b>COUNSEL_N = 1</b> 1.0 (0.5-2.3)	<b>COUNSEL_N = 0</b> 1.6 (1.1-2.2)	
Not covered	0.7	(0.5 – 1.1)	0.4 (0.2-0.9)	0.5 (0.3-0.9)	
<b>Number of office visits past 12 months</b>					
0		1.0			
1	1.3	(0.5 – 3.3)			
2 to 5	3.2	(1.8 – 5.7)			
6 to 12	3.8	(2.1 – 6.7)			
13+	7.7	(4.3 – 13.8)			
<b>Couldn't afford mental health care, past 12 months</b>					
No		1.0		1.0	
Yes	1.8	(1.3 – 2.5)	<b>Not covered</b> 1.8 (0.9-3.5)	<b>Public only</b> 1.5 (0.9-2.6)	<b>Any private</b> 2.3 (1.2-4.3)

\*Only assessed in the 2012 NHIS survey

\*\*OR=odds ratio

Characteristic	Unadjusted		Adjusted Model 4 demographics + insurance		Adjusted Model 5 demographics + education	
	OR**	95% C.I.	OR**	95% C.I.	OR**	95% C.I.
<b>Age</b>						
18-44	4.1	(2.6 – 6.3)	5.0	(3.2 – 7.8)	4.0	(2.5 – 6.2)
45-64	3.0	(2.1 – 4.3)	3.5	(2.4 – 5.1)	2.9	(2.0 – 4.2)
≥65		1.0		1.0		1.0
<b>Sex</b>						
Male		1.0		1.0		1.0
Female	1.0	(0.8 – 1.4)	1.1	(0.8 – 1.5)	1.1	(0.8 – 1.5)
<b>Race/ethnicity</b>						
White, non-Hispanic		1.0		1.0		1.0
Black, non-Hispanic	0.9	(0.6 – 1.2)	0.8	(0.5 – 1.1)	0.8	(0.6 – 1.2)
Hispanic	0.8	(0.6 – 1.2)	0.8	(0.6 – 1.2)	1.0	(0.7 – 1.4)
Asian, non-Hispanic	0.2	(0.1 – 0.6)	0.2	(0.1 – 0.7)	0.2	(0.0 – 0.7)
Other	1.0	(0.4 – 2.2)	0.8	(0.3 – 1.8)	0.9	(0.4 – 2.2)
<b>Highest education</b>						
Less than high school	0.4	(0.2 – 0.7)			0.4	(0.2 – 0.7)
High school diploma	0.6	(0.4 – 1.0)			0.5	(0.3 – 0.9)
Some college or Associates degree	0.9	(0.5 – 1.4)			0.7	(0.4 – 1.2)
College or greater		1.0				1.0
<b>Employment status</b>						
Employed		1.0				
Retired	0.6	(0.4 – 1.0)				
Disabled	2.0	(1.4 – 2.9)				
Unemployed	1.9	(1.1 – 3.3)				
Volunteer/NILF	0.7	(0.4 – 1.4)				
<b>Marital status</b>						
Married		1.0				
Widowed	0.6	(0.4 – 0.9)				
Divorced/separated	1.3	(1.0 – 1.8)				
Never married	1.7	(1.2 – 2.5)				
Living with partner	1.1	(0.6 – 1.8)				
<b>Health insurance</b>						
Any private		1.0		1.0		
Public only	1.4	(1.0 – 1.9)	1.5	(1.1 – 2.1)		
Not covered	0.7	(0.5 – 1.1)	0.6	(0.4 – 0.9)		
<b>Number of office visits past 12 months</b>						
0		1.0				
1	1.3	(0.5 – 3.3)				
2 to 5	3.2	(1.8 – 5.7)				
6 to 12	3.8	(2.1 – 6.7)				
13+	7.7	(4.3 – 13.8)				
<b>Couldn't afford mental health care, past 12 months</b>						
No		1.0				
Yes	1.8	(1.3 – 2.5)				

\*Only assessed in the 2012 NHIS survey

\*\*OR=odds ratio



Characteristic	Unadjusted		Adjusted Model 6 ographics + education + insurance		Adjusted Model 7 ographics + education + coun	
	OR**	95% C.I.	OR**	95% C.I.	OR**	95% C.I.
<b>Age</b>						
18-44	4.1	(2.6 – 6.3)	4.8	(3.0 – 7.6)	3.6	(2.2 – 5.7)
45-64	3.0	(2.1 – 4.3)	3.4	(2.3 – 5.0)	2.7	(1.8 – 3.9)
≥65		1.0		1.0		1.0
<b>Sex</b>						
Male		1.0		1.0		1.0
Female	1.0	(0.8 – 1.4)	1.1	(0.8 – 1.5)	1.1	(0.8 – 1.5)
<b>Race/ethnicity</b>						
White, non-Hispanic		1.0		1.0		1.0
Black, non-Hispanic	0.9	(0.6 – 1.2)	0.8	(0.5 – 1.1)	0.8	(0.6 – 1.2)
Hispanic	0.8	(0.6 – 1.2)	0.9	(0.7 – 1.3)	1.0	(0.7 – 1.5)
Asian, non-Hispanic	0.2	(0.1 – 0.6)	0.2	(0.1 – 0.7)	0.2	(0.0 – 0.7)
Other	1.0	(0.4 – 2.2)	0.8	(0.3 – 2.0)	1.0	(0.4 – 2.4)
<b>Highest education</b>						
Less than high school	0.4	(0.2 – 0.7)	0.3	(0.2 – 0.6)	0.4	(0.2 – 0.7)
High school diploma	0.6	(0.4 – 1.0)	0.5	(0.3 – 0.8)	0.5	(0.3 – 0.9)
Some college or Associates degree	0.9	(0.5 – 1.4)	0.7	(0.4 – 1.2)	0.8	(0.5 – 1.3)
College or greater		1.0		1.0		1.0
<b>Employment status</b>						
Employed		1.0				
Retired	0.6	(0.4 – 1.0)				
Disabled	2.0	(1.4 – 2.9)				
Unemployed	1.9	(1.1 – 3.3)				
Volunteer/NILF	0.7	(0.4 – 1.4)				
<b>Marital status</b>						
Married		1.0				
Widowed	0.6	(0.4 – 0.9)				
Divorced/separated	1.3	(1.0 – 1.8)				
Never married	1.7	(1.2 – 2.5)				
Living with partner	1.1	(0.6 – 1.8)				
<b>Health insurance</b>						
Any private		1.0		1.0		
Public only	1.4	(1.0 – 1.9)	1.8	(1.3 – 2.5)		
Not covered	0.7	(0.5 – 1.1)	0.7	(0.4 – 1.0)		
<b>Number of office visits past 12 months</b>						
0		1.0				
1	1.3	(0.5 – 3.3)				
2 to 5	3.2	(1.8 – 5.7)				
6 to 12	3.8	(2.1 – 6.7)				
13+	7.7	(4.3 – 13.8)				
<b>Couldn't afford mental health care, past 12 months</b>						
No		1.0				1.0
Yes	1.8	(1.3 – 2.5)			1.5	(1.0 – 2.0)

\*Only assessed in the 2012 NHIS survey

\*\*OR=odds ratio

Characteristic	Unadjusted		Adjusted Model 8 ographics + insurance + couns		Adjusted Model 9 ics + education + insurance +	
	OR**	95% C.I.	OR**	95% C.I.	OR**	95% C.I.
<b>Age</b>						
18-44	4.1	(2.6 – 6.3)	4.4	(2.8 – 7.0)	4.2	(2.6 – 6.8)
45-64	3.0	(2.1 – 4.3)	3.2	(2.2 – 4.7)	3.1	(2.1 – 4.6)
≥65		1.0		1.0		1.0
<b>Sex</b>						
Male		1.0		1.0		1.0
Female	1.0	(0.8 – 1.4)	1.1	(0.8 – 1.5)	1.1	(0.8 – 1.5)
<b>Race/ethnicity</b>						
White, non-Hispanic		1.0		1.0		1.0
Black, non-Hispanic	0.9	(0.6 – 1.2)	0.8	(0.5 – 1.1)	0.8	(0.5 – 1.1)
Hispanic	0.8	(0.6 – 1.2)	0.9	(0.6 – 1.3)	1.0	(0.7 – 1.4)
Asian, non-Hispanic	0.2	(0.1 – 0.6)	0.3	(0.1 – 0.8)	0.2	(0.1 – 0.7)
Other	1.0	(0.4 – 2.2)	0.9	(0.4 – 2.0)	0.9	(0.4 – 2.3)
<b>Highest education</b>						
Less than high school	0.4	(0.2 – 0.7)			0.3	(0.2 – 0.6)
High school diploma	0.6	(0.4 – 1.0)			0.5	(0.3 – 0.9)
Some college or Associates degree	0.9	(0.5 – 1.4)			0.7	(0.4 – 1.2)
College or greater		1.0				1.0
<b>Employment status</b>						
Employed		1.0				
Retired	0.6	(0.4 – 1.0)				
Disabled	2.0	(1.4 – 2.9)				
Unemployed	1.9	(1.1 – 3.3)				
Volunteer/NILF	0.7	(0.4 – 1.4)				
<b>Marital status</b>						
Married		1.0				
Widowed	0.6	(0.4 – 0.9)				
Divorced/separated	1.3	(1.0 – 1.8)				
Never married	1.7	(1.2 – 2.5)				
Living with partner	1.1	(0.6 – 1.8)				
<b>Health insurance</b>						
Any private		1.0		1.0		1.0
Public only	1.4	(1.0 – 1.9)	1.6	(1.2 – 2.1)	1.7	(1.2 – 2.4)
Not covered	0.7	(0.5 – 1.1)	0.5	(0.3 – 0.8)	0.5	(0.4 – 0.8)
<b>Number of office visits past 12 months</b>						
0		1.0				
1	1.3	(0.5 – 3.3)				
2 to 5	3.2	(1.8 – 5.7)				
6 to 12	3.8	(2.1 – 6.7)				
13+	7.7	(4.3 – 13.8)				
<b>Couldn't afford mental health care, past 12 months</b>						
No		1.0		1.0		1.0
Yes	1.8	(1.3 – 2.5)	1.7	(1.2 – 2.5)	1.7	(1.2 – 2.5)

\*Only assessed in the 2012 NHIS survey

\*\*OR=odds ratio

Characteristic	Unadjusted		Adjusted Model 10 education + insurance + employment	
	OR**	95% C.I.	OR**	95% C.I.
<b>Age</b>				
18-44	4.1	(2.6 – 6.3)	4.5	(2.6 – 7.7)
45-64	3.0	(2.1 – 4.3)	2.7	(1.7 – 4.3)
≥65		1.0		1.0
<b>Sex</b>				
Male		1.0		1.0
Female	1.0	(0.8 – 1.4)	1.2	(0.8 – 1.6)
<b>Race/ethnicity</b>				
White, non-Hispanic		1.0		1.0
Black, non-Hispanic	0.9	(0.6 – 1.2)	0.7	(0.5 – 1.1)
Hispanic	0.8	(0.6 – 1.2)	1.1	(0.8 – 1.5)
Asian, non-Hispanic	0.2	(0.1 – 0.6)	0.2	(0.0 – 0.8)
Other	1.0	(0.4 – 2.2)	0.8	(0.3 – 2.1)
<b>Highest education</b>				
Less than high school	0.4	(0.2 – 0.7)	0.3	(0.2 – 0.5)
High school diploma	0.6	(0.4 – 1.0)	0.5	(0.3 – 0.8)
Some college or Associates degree	0.9	(0.5 – 1.4)	0.6	(0.4 – 1.1)
College or greater		1.0		1.0
<b>Employment status</b>				
Employed		1.0		1.0
Retired	0.6	(0.4 – 1.0)	1.6	(0.9 – 2.8)
Disabled	2.0	(1.4 – 2.9)	2.4	(1.6 – 3.5)
Unemployed	1.9	(1.1 – 3.3)	2.1	(1.2 – 3.7)
Volunteer/NILF	0.7	(0.4 – 1.4)	0.7	(0.4 – 1.4)
<b>Marital status</b>				
Married		1.0		
Widowed	0.6	(0.4 – 0.9)		
Divorced/separated	1.3	(1.0 – 1.8)		
Never married	1.7	(1.2 – 2.5)		
Living with partner	1.1	(0.6 – 1.8)		
<b>Health insurance</b>				
Any private		1.0		1.0
Public only	1.4	(1.0 – 1.9)	1.3	(0.9 – 1.8)
Not covered	0.7	(0.5 – 1.1)	0.5	(0.3 – 0.7)
<b>Number of office visits past 12 months</b>				
0		1.0		
1	1.3	(0.5 – 3.3)		
2 to 5	3.2	(1.8 – 5.7)		
6 to 12	3.8	(2.1 – 6.7)		
13+	7.7	(4.3 – 13.8)		
<b>Couldn't afford mental health care, past 12 months</b>				
No		1.0		1.0
Yes	1.8	(1.3 – 2.5)	1.6	(1.1 – 2.4)

\*Only assessed in the 2012 NHIS survey

\*\*OR=odds ratio