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Arthritis in young adulthood and participation in employment and education: A population-level analysis

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Abstract

Objectives: To examine the association between arthritis diagnosis and educational and employment participation among young adults, and to determine whether findings differ by self-rated health.

Methods: Data from the National Health Interview Survey, years 2009 to 2014, were combined and analyzed. Our sample was restricted to those aged 18-29 years either diagnosed with arthritis (n = 1,888) or not (n = 35,051). Prevalence and correlates of employment and educational participation in the past week were compared by arthritis status. Demographic characteristics, social role participation restrictions, health factors, and health system use variables were included as covariates. Self-rated health and arthritis diagnosis interaction was also examined within models. Weighted proportions, univariate, and multivariate associations were calculated to examine the association between arthritis and educational and employment participation.

Results: Arthritis respondents were more likely to be female, married, report more social participation restrictions, fair/poor health, and functional limitations than those without arthritis. In multivariate models, arthritis was significantly associated with slightly higher employment participation (PR = 1.08; 95%CI 1.03-1.14), but not with educational participation (PR = 0.75; 95%CI 0.56-1.02). Stratified analyses showed that among those reporting higher self-rated health, arthritis diagnosis was associated with higher employment participation (PR = 1.09; 95%CI 1.03-1.14).

Conclusion: For young adults with arthritis there may be need to design interventions that focus both on improving self-rated health and promoting labor market participation.

Keywords

Young adulthood; rheumatic disease diagnosis; employment; education; transition to adulthood

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INTRODUCTION

In the United States, as in many other industrialized countries, arthritis is significantly related to work disability and challenges with educational attainment (1-4). While arthritis is diagnosed across the life course (5), research examining career experiences has focused on middle- and older-aged adults (6), and few studies have examined the educational and employment participation of young adults with arthritis.

Young adulthood is a unique time of life where a person may increasingly participate in social roles (e.g., marriage, parenting, and full-time employment) that mark a transition from the dependency of childhood to independence of adulthood (7). Of particular importance, involvement in educational and paid and unpaid work roles in young adulthood can provide opportunities for vocational skills building that determine a person's career trajectory (7). Challenges with education and employment in young adulthood can have potential adverse economic consequences that can extend across the working life course including persistent unemployment, reduced long-term earnings, and deterioration of skills (8, 9). Other research finds that young adults are considered a vulnerable segment of the labor market and are more susceptible to shifts in economic conditions. These studies suggest that young adults are more likely to report unemployment, job strain, and periods of idleness (e.g. in neither education nor employment) when compared with middle-aged adults at the later phases of their career (8-10). An arthritis diagnosis may add to the challenges faced by young adults in their early work experiences.

Recently, demographic trends indicate that young people are extending the time spent in transitional roles as a way to delay entering adulthood (7, 11). Delayed transitions to adulthood may provide opportunities for young adults to gain the competencies and experience necessary to compete in a knowledge-based economy (7). Young adults with chronic conditions, including those diagnosed with arthritis, also experience delayed transitions associated with interruptions to education and employment stemming from the time needed for treatment regimens or to recover from medical interventions (4, 12). The extended time spent in the young adult life phase could provide those with arthritis an opportunity to catch up to their peers without a health condition, and attain a similar level of educational and employment participation.

To date, a majority of research on the relationship between arthritis and work experiences has focused on middle- and older adults. These studies show that those living with arthritis are more likely to report challenges sustaining employment (3, 13), limitations performing workplace activities, and productivity losses when compared with non-arthritis peers (1, 14, 15). Little is known about the experiences of people diagnosed with arthritis at the early career phase. In a recent literature review of primarily clinic-based studies of young people with arthritis, results showed mixed findings with some studies suggesting that young adults with arthritis are less likely to be employed when compared to their peers without a health condition and others indicating similar or higher employment participation (6, 16, 17).

One consistent research finding among existing clinic-based studies of young adults with arthritis is that those reporting poorer health outcomes, including lower self-rated health

status and greater pain, fatigue, activity limitations and disease activity, were less likely to participate in education and employment when compared to those reporting more favorable health outcomes (6, 12, 18-21). These studies suggest that difficulties with the management and control of symptoms associated with arthritis may play a significant role in determining involvement in transitional roles. At the population-level, however, no studies have examined whether educational and employment participation differs among young adults with and without an arthritis diagnosis based on health status.

We use a national population-based data source to examine the association between arthritis diagnosis and participation in employment and education in the young adult life phase. We also examine whether employment and educational participation differ when compared by higher and lower self-rated health status among those with and without arthritis. Self-rated health was chosen because of its previously established association with arthritis symptoms (e.g., pain, fatigue and activity limitations) and ability to capture the perceived health status of arthritis and non-arthritis samples at a population level (22-24). We hypothesize that an arthritis diagnosis in young adulthood will be associated with a lower prevalence of educational and employment participation when compared with their peers without arthritis. We also hypothesize that the relationship between arthritis diagnosis and lower prevalence of educational and employment participation will remain consistent when comparing young adults by self-rated health status.

METHODS

Sample

Data from the 2009-2014 US National Health Interview Survey (NHIS) were combined and analyzed (25). NHIS is an ongoing health survey of all ages and uses a complex design to select a sample representing the US civilian, non-institutionalized population. Data are collected through in-home interviews conducted by trained interviewers (25). Our study focused on young adults (18-29 years) with (n = 1,888) and without (n = 35,051) an arthritis diagnosis who had records in the sample adult core and person files (25). In the NHIS, arthritis is defined using 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?”

Outcome measures

Both outcomes of interest, participation in employment and education, were determined by asking respondents the question “What is your correct working status in the last week?” Those not employed were asked about the main reason for not working. Based on responses, participants were uniquely classified as employed, student, unemployed, disabled, or other (e.g., retired, homemaker). Those employed were considered to participate in employment, and students were considered to participate in education.

Covariates

Covariates were included in the analyses because of their association with employment and educational outcomes documented in previous literature (6).

Demographic variables: Sex, race/ethnicity (i.e., non-Hispanic white, non-Hispanic black, Hispanic, and non-Hispanic other/multiple race), marital status (yes/no married or living as married), and highest level of educational attainment were analyzed.

Social participation restriction: We defined restricted social participation as those who reported "very difficult" or "can't do at all" to at least one of two questions asking about the ability to participate in social activities outside the home (e.g., go shopping, to the movies, or sporting events; attend clubs, parties, meetings, or visit friends) (26).

Health factors: We examined self-rated health by asking the participant "In general, would you say that your health is..." response options included poor, fair, good, very good and excellent. Consistent with previous studies, participants reporting good/very good/ excellent health were clustered into one group, labeled as "higher self-rated health". Those reporting fair/poor health were grouped together as "lower self-rated health" (23, 27).

Other health factors examined included the number self-reported doctor-diagnosed comorbid conditions from a list of nine (i.e., hypertension, heart diseases, stroke, diabetes, asthma, cancer, weak or failing kidneys, hepatitis, and chronic obstructive pulmonary disease), smoking status and body mass index (calculated as kg/m^2 from self-reported weighted and height: underweight/normal [≤24.9], overweight [25.0-29.9], and obese [≥30]). We defined functional limitation as those who answered "very difficult" or "can't do at all" to one or more of eight activities (i.e., push/pull large objects, walk ¼ mile, stand for 2 hours, sit for 2 hours, stoop/bend/kneel, reach over one's head, grasp small objects, climb stairs). We defined serious psychological distress as those scoring ≥ 13 out of 30 using a validated six item scale for population surveillance (28).

Healthcare service utilization: We defined health insurance as covered/not covered based on self-report, and also number of doctor visits in the past year (i.e., 0-1, 2-5, or ≥6 visits).

Analysis

We tested the study hypotheses using descriptive, univariate, and multivariate analyses. To generate nationally representative population estimates, we applied sampling weights created by National Center for Health Statistics in all analyses. We used SAS software Version 9, which includes complex survey design procedures (29), and SUDAAN (30).

Weighted proportions with 95% confidence intervals (95% CIs) for the outcome measures and all study covariates were generated. Non-overlapping 95% CIs were used to conservatively indicate a statistically significant difference between the two groups. Weighted proportions were used to compare the relationship between arthritis and educational and employment participation by self-rated health status to identify potential interaction effects.

Next, we evaluated the association between arthritis and participation in education or employment in two ways using prevalence ratios (PR) with 95% CIs calculated from predicted margins. We first generated univariate models for each outcome with arthritis

status as the exposure. Then, we controlled for study covariates in separate multivariate logistic regression models. The logistic models examined education and employment as their primary outcome variables. Not being involved in education or employment was the reference variable in each model, respectively. We used backwards elimination as the strategy for variable selection in the models ending when all variables were under the $\alpha \leq 0.10$ level. We conducted an additional multivariate logistic model, stratified by higher and lower self-rated health in models where the interaction between self-rated health and arthritis diagnosis was significant.

RESULTS

A description and comparison of young adults with and without arthritis is provided in Table 1. Mirroring population patterns in older age groups, young adults with arthritis were more often female (58.5% versus 49.7%) and married/living as if married (48.0% versus 34.9%), but reported similar educational attainment when compared with their peers without arthritis. Although generally low, those with arthritis indicated restricted social participation compared to those without arthritis (5.5% versus 0.8%). Arthritis diagnosis in young adulthood was associated with a higher prevalence of self-rated fair/poor health (19.6% versus 4.2%), obesity (37.1% versus 19.9%), one or more comorbid conditions (41.9% versus 15.6%), one or more functional limitations (23.2% versus 2.7%), serious psychological distress (9.7% versus 2.4%), and current smoking (35.4% versus 20.2%) when compared to those without arthritis. Arthritis diagnosis was also associated with a higher prevalence of reporting more than six doctor visits in the past year and a slightly higher prevalence of health insurance coverage when compared to those without arthritis.

Univariate analyses indicated that young adults with arthritis reported a similar prevalence of employment participation when compared with their peers without arthritis (63.1% versus 66.2%; univariate PR = 0.95; 95%CI = 0.90 - 1.01). Educational participation among respondents with arthritis was less than half that of their peers without arthritis (6.3% versus 12.8%; univariate PR = 0.49; 95% CI = 0.36 - 0.68) (Table 1).

Among those with higher self-rated health, young adults with arthritis reported similar employment participation when compared with those without arthritis (70.3% versus 67.1%) (Table 2). Among those with lower self-rated health, young adults with arthritis had lower employment participation when compared with those without arthritis (33.1% versus 46.1%). The prevalence estimate for educational participation among those with either higher or lower self-rated health and arthritis were unreliable (relative standard error [RSE] > 30%). Accordingly, for the educational participation model, the self-rated health-arthritis diagnosis interaction was not presented in Table 2 or carried forward in subsequent multivariate analysis.

Table 3 presents findings from the multivariate model examining the association between arthritis diagnosis and educational participation when controlling for demographic, social role participation restriction, health factors and health service use variables. Although findings were statistically similar, the prevalence of educational participation among young

adults with arthritis was slightly lower than their peers without any health condition (PR = 0.75; 95%CI 0.56-1.02).

As shown in Table 4, controlling for the covariates that met model-building criteria, an arthritis diagnosis in young adulthood was associated a slightly increased likelihood of employment participation (PR = 1.08; 95% CI 1.03-1.14). Of note, the interaction between arthritis diagnosis and self-rated health was significantly associated with employment participation (PR = 1.09; 95%CI 1.04-1.15) and indicated a need for a multivariate model stratified by self-rated health. Results of the stratified multivariable model comparing results by higher and lower self-rated health are displayed in Table 5. Among young adults reporting higher self-rated health, an arthritis diagnosis was associated with 9% higher prevalence of employment participation when compared to those without arthritis (PR = 1.09; 95%CI 1.03 – 1.14). Among those reporting lower self-rated health, an arthritis diagnosis was associated with a similar prevalence of employment participation when compared to peers without arthritis (PR = 0.86; 95%CI 0.69-1.07).

DISCUSSION

This study was the first to conduct a population-level examination of participation in education and employment of young adults diagnosed with arthritis. While statistically similar, young adults with arthritis reported a slightly lower prevalence of educational involvement in relation to their non-arthritis counterparts. Interestingly, arthritis diagnosis was associated with an increased likelihood of participating in employment. Notably, the significant association between arthritis and a higher likelihood of employment was only reported among young adults also reporting higher self-rated health. Findings suggest the need to design interventions that address both self-rated health and the promotion of labor market participation. Results also provide a foundation for future research to understand the educational and employment experiences of young adults with arthritis.

Our study points to a potential association between arthritis diagnosis and a lower prevalence of participation in education. While statistically similar at the multivariate level, young adults with arthritis reported a slightly lower prevalence of educational participation. Findings may demonstrate a possible disadvantage young adults with arthritis possess when establishing their careers. US demographic data show that the number of young adults enrolled in post-secondary school has steadily increased over the last two decades to provide specialized competences and training required for higher paying and technical jobs (31). For young adults, an arthritis diagnosis may mean few opportunities to obtain educational resources to compete against peers for higher skilled jobs.

A stratified design enabled us to examine the association between arthritis and employment participation when compared by self-rated health. Stratified analysis also enabled us to account for potential suppression effects in the multivariate model. In contrast to our hypothesis, among young adults reporting higher self-rated health, an arthritis diagnosis was associated with significantly higher employment prevalence. Our research provides support for several previously conducted clinical studies of young adults, which also show that arthritis diagnosis can be associated with an increased likelihood of employment when

compared with those without arthritis (6, 16, 17, 32). Findings also indicate the importance of self-rated health in young adulthood and its association with vocational outcomes. At the same time, recent research highlights the challenges associated with delivery of health services to young people with arthritis including health service gaps during the pediatric to adult care transition (33, 34), ongoing disease activity (18), poor mental health (12, 18, 19), and lower perceived social support (21, 33, 35). Greater insights are needed to determine the types of interventions that should be delivered to young adults with arthritis to improve both health and employment outcomes. To compliment the findings from the current study, there is also a need to understand at-work experiences of young adult diagnosed with arthritis and their ability to stay at-work. A recent study of young adults with arthritis found that close to 40% of those working reported absenteeism, job disruptions, or a perceived productivity loss (36). Among young adults with arthritis, it is not clear what role work productivity losses may play in sustaining employment over a longer period of time, highlighting a critical knowledge gap.

The association between arthritis and higher prevalence of employment participation could also indicate an early transition into the labor market among those with higher self-rated health. Young adults with arthritis may have more of a need for income and/or extended medical benefits associated with paid work to independently manage their condition and participate in other valued social roles (e.g., living alone, supporting a spouse or family) (7, 11). An early employment transition could mean that young adults with arthritis are forfeiting pre-vocational roles that are important to long-term career development such as graduate school, unpaid internships, or volunteering.

There are several study limitations to acknowledge. First, we utilize a self-reported question in the NHIS to identify young people with arthritis diagnosis. While this method does not substitute clinical diagnosis, it is considered a valid case-finding question for public health surveillance (37). Our data are cross-sectional, and causation cannot be ascertained. Additionally, we offer a snapshot of educational and employment experience in the past week, and may not capture unpredictable interruptions to education and employment that may be associated with episodic arthritis symptoms over a longer period (15). Study strengths include the use of a large and rich source of data for education, employment, and various covariates. The NHIS also enabled us to ascertain a large representative sample of young adults with arthritis and conduct a population-based study focused on the nation.

Young adulthood is a time of life where a person typically establishes their career. By utilizing population-level data of young adults with and without arthritis this study was the first to compare participation in educational and employment roles. While few significant differences existed, results did highlight higher employment prevalence among young adults with arthritis who also indicated higher self-rated health. Findings point to the importance of sustaining self-rated health in young adulthood to labor market involvement. Overall, our study provides important insights on early career experiences and contributes to a growing body of scholarship that aims at minimizing work disability across the life course for people living with arthritis.

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SIGNIFICANCE AND INNOVATIONS

- At the population level, no studies have examined the association between arthritis and educational and employment participation during the young adult life phase.
- Among young adults, arthritis was associated with greater employment participation, but only among those indicating greater self-rated health.
- Findings point to the need to plan interventions that may focus on improving both self-rated health and promoting labor market participation of younger populations with arthritis.

Table 1:

Unweighted and weighted distributions of sample characteristics of young adults (18-29 years), with and without doctor-diagnosed arthritis, 2009-2014 National Health Interview Survey.

	Doctor diagnosed arthritis				Without doctor diagnosed arthritis			
	n unweighted	N weighted	%	95% CI	n unweighted	N weighted	%	95% CI
Total	1,188	1,677,361			35,051	48,907,368		
Demographic factors								
Sex								
Male	431	696,061	41.5	37.9 – 45.1	16,294	24,623,047	50.3	49.6 - 51.1
Female	757	981,301	58.5	54.9 – 62.1	18,757	24,284,321	49.7	48.9 – 50.4
Race/ethnicity								
Non-Hispanic white	783	1,196,321	71.3	67.8 – 74.8	18,030	29,064,761	59.4	58.3 – 60.5
Non-Hispanic black	193	237,818	14.2	11.5 – 16.9	5561	6,884,343	14.1	13.4 – 14.7
Hispanic	155	172,671	10.3	8.1 – 12.5	8398	9,909,058	20.3	19.4 – 21.1
Non-Hispanic other	57	70,551	4.2	2.8 – 5.7	3062	3,049,206	6.2	5.8 – 6.7
Married or living as married								
Yes	507	805,219	48.0	44.4 – 51.7	11579	17,053,316	34.9	34.0 – 35.7
No	681	872,143	52.0	48.3 – 55.6	23472	31,854,052	65.1	64.3 – 66.0
Education								
Less than high school	141	220,266	13.1	10.4 – 15.9	4,761	6,855,100	14.1	13.4 – 14.7
High school or equivalent	325	502,632	30.0	26.4 – 33.5	8813	13,017,924	26.7	25.9 – 27.5
Some college/associate degree	375	491,074	29.3	26.0 – 32.6	10233	14,773,700	30.3	29.4 – 31.2
College graduate or above	347	463,389	27.6	24.5 - 30.7	11162	14,130,640	29.0	28.1 - 29.8
Social participation								
Restricted	64	91,620	5.5	3.9 – 7.0	253	412,615	0.8	0.7 – 1.0
Not restricted	1124	1,585,741	94.5	93.0 – 96.1	34798	48,494,753	99.2	99.0 – 99.3
Health factors								
Self-rated health								
Higher (Excellent/very good/good)	955	1,347,317	80.4	77.5 – 83.3	33,406	46,856,500	95.8	95.6 – 96.1
Lower (Fair/poor)	232	329,058	19.6	16.7 – 22.5	1637	2,044,389	4.2	3.9 – 4.4
Body mass index (kg/m^2)								

	Doctor diagnosed arthritis				Without doctor diagnosed arthritis			
	n unweighted	N weighted	%	95% CI	n unweighted	N weighted	%	95% CI
Under- or normal weight (< 25.0)	421	597,674	36.4	32.8 – 39.9	17577	24,826,442	52.0	51.3 – 52.8
Over weight (25.0 – 29.9)	324	436,335	26.6	23.4 – 29.8	9729	13,384,453	28.0	27.3 – 28.8
Obese (> 30.0)	417	608,878	37.1	33.4 – 40.7	6838	9,515,613	19.9	19.4 – 20.5
Number of comorbid conditions								
None	723	975,134	58.1	54.2 – 62.0	29,353	41,311,557	84.5	84.0 – 84.9
One	333	504,712	30.1	26.6 – 33.6	4,944	6,601,553	13.5	13.1 – 13.9
Two	97	152,899	9.1	6.9 – 11.3	653	864,474	1.8	1.6 – 1.9
Three or more	35	44,617	†	†	101	129,784	0.3	0.2 – 0.3
Specific functional limitation								
One or more limitations	269	388,581	23.2	20.0 – 26.3	932	1,322,984	2.7	2.5 – 2.9
No limitations	919	1,288,780	76.8	73.7 – 80.0	34,119	47,584,383	97.3	97.1 – 97.5
Serious psychological distress								
Yes	121	159,352	9.7	7.5 – 11.9	844	1,136,164	2.4	2.1 – 2.6
No	1049	1,486,491	90.3	88.1 – 92.5	33,718	47,105,060	97.6	97.4 – 97.9
Smoking status								
Current smoker	414	593,724	35.4	31.7 – 39.1	6,979	9,861,292	20.2	19.6 – 20.9
Former smoker	131	170,619	10.2	8.0 – 12.3	2,877	3,934,608	8.1	7.7 – 8.5
Never smoker	642	910,975	54.4	50.6 – 58.2	25,072	34,928,750	71.7	70.9 – 72.5
Health service use variables								
Number of doctor visits								
None or one	303	406,213	24.5	21.5 – 27.5	17,376	24,280,888	50.3	49.5 – 51.0
Two to five	435	602,271	36.3	32.8 – 39.9	11,865	16,778,885	34.7	34.0 – 35.5
More than six	437	649,848	39.2	35.5 – 42.8	5,347	7,230,485	15.0	14.4 – 15.5
Health insurance								
Not covered	268	372,755	22.4	19.5 – 25.3	9,541	12,979,574	26.7	26.0 – 27.5
Covered	914	1,293,578	77.6	74.7 – 80.5	25,278	35,552,165	73.3	72.5 – 74.0
Work status in the past week								
Employed (employment participation)	754	1,050,704	63.1	59.4 – 66.9	23,648	32,292,033	66.2	65.4 – 67.0
Student (educational participation)	73	105,076	6.3	4.3 – 8.3	4,116	6,236,096	12.8	12.0 – 13.5
Unemployed	141	200,292	12.0	9.4 – 14.6	4,165	6,354,462	13.0	12.5 – 13.6

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	Doctor diagnosed arthritis				Without doctor diagnosed arthritis			
	n unweighted	N weighted	%	95% CI	n unweighted	N weighted	%	95% CI
Disabled	122	181,509	10.9	8.7 – 13.2	636	1,016,536	2.1	1.8 – 2.3
Other (homemaker/retired)	91	126,921	7.6	5.8 – 9.5	2,380	2,876,077	5.9	5.5 – 6.2

Notes: † = Estimate is potentially unreliable with a relative standard error between 20–30 and not presented in this table.

Table 2.

Unweighted and weighted distributions of employment participation by arthritis and self-rated health status among young adults (18-29 years).

	Employment Participation							
	Higher self-rated health‡				Lower self-rated health‡‡			
	n unweighted	N weighted*	%†	95% CI	n unweighted	N weighted*	%†	95% CI
Arthritis	670	943,186	70.3	66.5 – 73.9	83	106,530	33.1	25.9 – 41.1
No arthritis	22,838	31,351,164	67.1	66.2 – 67.9	804	936,502	46.1	43.1 – 49.1

Notes: * = single year estimate; † = Estimated rates for employed (numerator) out the of the specified group row (denominator) and may not sum up to 100%; ‡ = higher self-rated health includes those who reported that their health was excellent, very good or good ; ‡‡ = lower self-rated health included those reporting that their health was fair or poor.

Table 3:

Prevalence ratios from a multivariable model examining the association between arthritis and educational participation.

	Educational participation		
	PR	**SE**	**95% CI**
Arthritis diagnosis			
Arthritis diagnosis vs. no arthritis diagnosis	0.75	0.11	0.56 – 1.02
Demographic factors			
Sex			
Male vs. female	1.05	0.05	0.96 – 1.15
Race/ethnicity			
Non-Hispanic black vs. non-Hispanic white	0.97	0.06	0.87 – 1.09
Hispanic vs. non-Hispanic white	1.06	0.05	0.96 – 1.17
Non-Hispanic other vs. non-Hispanic white	1.72	0.09	1.55 – 1.90
Marital status			
Not married vs. married or living as if married	4.40	0.28	3.88 – 5.00
Social participation restrictions			
Not restricted vs. restricted	1.99	0.56	1.13 – 3.47
Health factors			
Self-rated health			
Higher vs. lower	1.09	0.12	0.89 – 1.35
Body mass index (kg/m^2)			
Underweight/normal weight vs. overweight	1.29	0.06	1.17 – 1.41
Underweight/normal weight vs. obese	1.64	0.09	1.47 – 1.83
Smoking status			
Never smoked vs. current smoker	2.53	0.18	2.20 – 2.92
Never smoked vs. former smoker	1.68	0.16	1.39 – 2.02
Health service use variables			
Number of doctor visits			
2 -5 visits vs. ≤ 1	1.10	0.05	1.01 – 1.20
≥ 5 visits vs. ≤ 1	1.01	0.06	0.89 – 1.14
Health insured			

	Educational participation		
	PR	SE	95% CI
Covered vs. not covered	1.68	0.10	1.50 – 1.89

Notes: PR = Prevalence ratio; SE = Standard error; CI = 95% confidence interval; * = Education was not considered as a candidate variable for the current student model.

Table 4:

Prevalence ratios from a multivariable model examining the association between arthritis and employment participation.

	Employment Participation		
	PR	**SE**	**95% CI**
Arthritis diagnosis			
Arthritis diagnosis vs. no arthritis diagnosis	1.08	0.03	1.03 – 1.14
Demographic factors			
Sex			
Male vs. female	1.09	0.01	1.07 – 1.12
Race/ethnicity			
Non-Hispanic black vs. non-Hispanic white	0.89	0.01	0.87 – 0.92
Hispanic vs. non-Hispanic white	0.98	0.01	0.95 – 1.01
Non-Hispanic other vs. non-Hispanic white	0.78	0.02	0.74 – 0.81
Education			
College and above vs. less than high school	1.68	0.04	1.61 – 1.76
College and above vs. high school or equivalent	1.29	0.02	1.26 – 1.33
College and above vs. some college	1.26	0.02	1.22 – 1.29
Marital status			
Not married vs. married or living as if married	0.89	0.01	0.87 – 0.91
Social participation			
Not restricted vs. restricted	1.79	0.20	1.43 – 2.24
Health factors			
Self-rated health			
Excellent/very good/good vs. fair/poor	1.13	0.03	1.07 – 1.19
Body mass index (kg/m^2)			
Underweight/normal weight vs. overweight	0.93	0.01	0.91 – 0.95
Underweight/normal weight vs. obese	0.94	0.01	0.92 – 0.96
Smoking status			
Never smoked vs. current smoker	0.96	0.01	0.93 – 0.98
Never smoked vs. former smoker	0.92	0.01	0.89 – 0.95
Serious psychological distress			

	Employment Participation		
	PR	**SE**	**95% CI**
Not psychologically distressed vs. psychologically distressed	1.19	0.05	1.10 – 1.29
Specific functional limitations			
No functional limitations vs. one or more limitations	1.24	0.05	1.15 – 1.34
Health service use variables			
Number of doctor visits			
2 -5 visits vs. ≤ 1	0.97	0.01	0.95 – 1.00
≥ 5 visits vs. ≤ 1	0.86	0.02	0.83 – 0.90
Health insured			
Covered vs. not covered	1.04	0.01	1.02 – 1.07
Arthritis diagnosis x self-rated health	1.09	0.03	1.04 – 1.15

Notes: PR = Prevalence ratio; SE = Standard error; CI = 95% confidence interval

Table 5.

Prevalence ratio for stratified multivariable model examining the association between arthritis diagnosis and employment participation, by self-rated health.

	Employment Participation							
	Higher self-rated health‡				Lower self-rated health‡‡			
	N	PR	95% CI	SE	N	PR	95% CI	SE
Arthritis diagnosis vs. no arthritis diagnosis†	32,848	1.09	1.03 – 1.14	0.03	1,726	0.86	0.69 – 1.07	0.09

Note: † = Model controlling for sex, ethnicity, marital status, education, social participation restriction, comorbidities, body mass index, smoking status, serious psychological distress, specific functional limitations, number of doctor visits, health insurance; ‡ = higher self-rated health includes those who reported that their health was excellent, very good or good ; ‡‡ = lower self-rated health included those reporting that their health was fair or poor.