Osteoarthritis Pain in the Workforce: Evaluating Its Impact on Health Status, Productivity, and Health Care Costs

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BACKGROUND

- Osteoarthritis (OA) is a degenerative joint disease that is ranked among the top 3 causes of disability in the United States (US)[1]
- OA is expected to be the fourth leading cause of disability worldwide by the year 2020[2]
- Although OA has been considered an age-related disease, its effects in patients who are active and employed has been increasingly recognized, and it has been reported that the primary driver of total costs are the indirect costs related to loss of work productivity[3-5]
- Pain is the cardinal feature of OA, and is generally the key outcome measured as well as the main focus of OA management strategies. However, there is a paucity of data on the impact of OA pain on work productivity and other outcomes in an employed population

OBJECTIVE

- To evaluate the impact of OA pain on health care resource utilization, productivity, and costs in employed individuals using data from the 2009 US National Health and Wellness Survey (NHWS)

METHODS

Study Population

- Subjects were chosen from the 2009 NHWS US database (N = 75,000)
- The NHWS is a self-administered, internet-based questionnaire
  - Nationwide sample of adults ≥18 years
  - Representation validated and weighted by gender, age, and race/ethnicity using the United States Bureau of the Census
- Eligibility for inclusion in the current analysis was:
  - Age 20 years or older
  - Currently employed, defined as full-time, part-time, or self-employed
- Subjects meeting the above criteria were then stratified into 2 groups:
  - Diagnosed with OA and experiencing arthritis pain in the past month (n = 2173)
  - Not diagnosed with osteoarthritis or not experiencing arthritis pain in the past month (n = 37,599)

Outcomes

- Demographics and health characteristics including age, gender, race/ethnicity, education, income, employment type, body mass index (BMI), Charlson Comorbidity Index
- Work productivity, assessed using the Work Productivity and Activity Impairment (WPAI)[6] questionnaire consisting of 4 subscales:
  - Absenteeism, defined as work time missed due to work absences
  - Presenteeism, defined as work time missed due to impairment while at work
  - Overall work impairment
  - Activity impairment
- Health-related quality of life (HRQoL), assessed using the physical and mental component summary scores from the SF-12v2 Health Survey[7]
- Health utility score calculated using the SF-6D (0 = death to 1 = perfect health)[8]
- Health care utilization by type and number within the past 6 months
  - Traditional
  - Non-traditional (acupuncturist, herbalist, etc)
  - Emergency department visits and hospitalizations
- Costs
  - Direct costs, estimated by multiplying units of resource categories for 6 months by the average cost of the resource derived from the Medical Expenditure Panel Survey database, and then multiplying by 2 to project annual costs
  - Indirect costs, calculated based on the method of Lofland et al.[9] using data from the WPAI and median annual income obtained through the Bureau of Labor Statistics
  - Total costs, estimated as the sum of direct costs and indirect costs

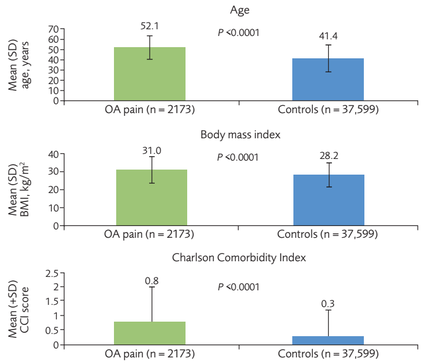
Analyses

- Bivariate analysis was used to examine differences in demographic and clinical characteristics between the 2 groups
- Comparisons of HRQoL and work productivity were performed using multivariate models that included relevant demographic and clinical covariates identified in bivariate analysis
- Significant differences between the 2 cohorts were examined using Wald chi-square tests for categorical outcomes and independent-samples *t*-tests for continuous outcomes
  - *P* values <0.05 were considered statistically significant

RESULTS

- Individuals in the OA pain cohort:
  - Were significantly older: mean age 52.1 ± 11.5 years versus 41.4 ± 13.2 years (*P* <0.0001; **Figure 1** and **Table 1**)
  - Had a tendency toward obesity: mean BMI 31.0 ± 7.4 versus 28.2 ± 6.7 (*P* <0.0001; **Figure 1**)
  - Had greater comorbidity burden: mean Charlson Comorbidity Index score 0.8 ± 1.2 versus 0.3 ± 0.9 (*P* <0.0001; **Figure 1**)
  - Were more likely to be female: 58.2% versus 45.9% (*P* <0.0001; **Table 1**)
  - Were less likely to be employed full time (57.3% vs. 70.7%; *P* <0.0001) and have an income ≥$75,000 (26.5% vs. 30.9%; *P* <0.0001) despite comparable levels of education (**Table 1**)

FIGURE 1: Mean values of select demographic and clinical variables



SD, standard deviation; OA, osteoarthritis; BMI, body mass index; CCI, Charlson Comorbidity Index

TABLE 1: Weighted bivariate statistics for demographic characteristics of the OA pain group compared with the control group

	OA pain (n = 2173)		Controls (n = 37,599)		
	n	Weighted percent (SE)	n	Weighted percent (SE)	*P*
Age range					
20–39 years	267	14.5 ± 0.8	16,123	47.7 ± 0.3	<0.0001
40–64 years	1453	71.8 ± 1.1	18,571	47.8 ± 0.3	<0.0001
≥65 years	453	13.7 ± 0 .9	2905	4.5 ± 0.1	<0.0001
Gender					
Male	954	41.8 ± 1.1	19,824	54.1 ± 0.3	<0.0001
Female	1219	58.2 ± 1.1	17,775	45.9 ± 0.3	<0.0001
Race/ethnicity					
White, non-Hispanic	1792	78.0 ± 1.1	26,347	66.5 ± 0.3	<0.0001
Black, non-Hispanic	169	8.4 ± 0.8	4434	12.1 ± 0.2	<0.0001
Hispanic	99	8.3 ± 0.8	3569	14.6 ± 0.2	<0.0001
Other	113	5.3 ± 0.5	3249	6.8 ± 0.1	0.0032
Education					
High school graduate or less	376	17.9 ± 0.9	6211	16.9 ± 0.2	0.3053
More than high school	1797	82.2 ± 0.9	31,387	83.1 ± 0.2	0.3067
Income					
<$25,000	294	13.5 ± 0.8	4205	11.6 ± 0.2	0.0183
$25,000 to $49,999	667	30.4 ± 1.1	10,807	29.1 ± 0.3	0.2218
$50,000 to $74,999	533	24.8 ± 1.0	9109	24.2 ± 0.2	0.5271
≥$75,000	579	26.5 ± 1.1	11,830	30.9 ± 0.3	<0.0001
Decline to answer	100	4.8 ± 0.5	1648	4.2 ± 0.1	0.2813
Employment					
Full-time	1200	57.3 ± 1.2	26,088	70.7 ± 0.3	<0.0001
Part-time	552	23.9 ± 1.1	7139	18.3 ± 0.2	<0.0001
Self-employed	421	18.8 ±0.9	4372	11.0 ± 0.2	<0.0001
Health insurance					
Yes	1880	85.4 ± 0.8	31,143	81.8 ± 0.2	<0.0001
No	293	14.6 ± 0.8	6456	18.2 ± 0.2	<0.0001
BMI					
Underweight	19	0.8 ± 0.2	629	1.7 ± 0.1	<0.0001
Normal	416	20.1 ± 1.0	11,889	32.1 ± 0.3	<0.0001
Overweight	660	30.0 ± 1.1	12,679	33.6 ± 0.3	0.0011
Obese	1044	47.5 ± 1.2	11,737	30.9 ± 0.3	<0.0001
Decline to answer	34	1.5 ± 0.3	665	1.8 ± 0.1	0.403

OA, osteoarthritis; SE, standard error; BMI, body mass index

- Health status was significantly lower among individuals with OA pain relative to controls (**Figure 2**)
- SF-6D health utility scores were significantly lower in the OA pain cohort (**Figure 2**)
- Across provider visit categories, significantly greater proportions of individuals with OA pain utilized traditional and non-traditional health care services relative to controls (**Figure 3**)
- Individuals with OA pain reported significantly greater impairment of work productivity and overall activity than controls (**Figure 4**)
- Percentage of absenteeism, presenteeism, overall work impairment, and activity impairment was almost twice as high in the OA pain cohort as controls (**Figure 4**)
- The primary driver of lost productivity was presenteeism, which was 30.7% in the OA pain cohort compared with 15.7% in the controls (*P* <0.0001; **Figure 4**)

FIGURE 2: Health status among individuals with osteoarthritis (OA) pain relative to controls

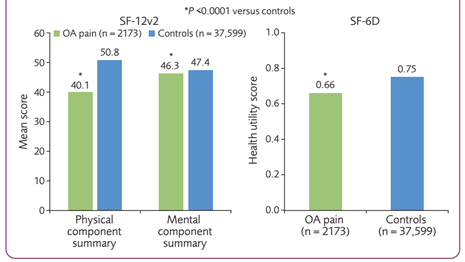
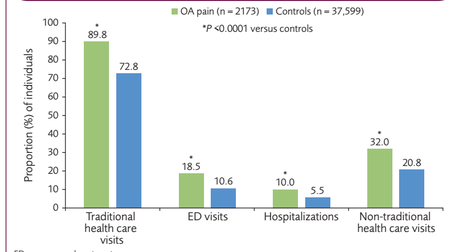
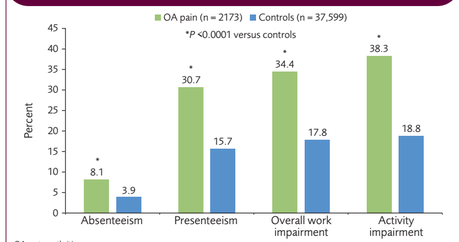


FIGURE 3: Health care resource utilization among individuals with osteoarthritis (OA) pain relative to controls



ED, emergency department

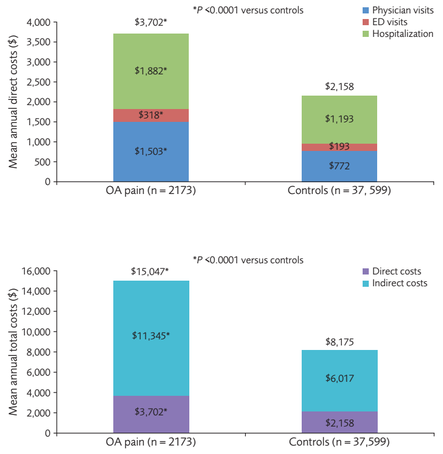
FIGURE 4: Impairment of productivity evaluated using the Work Productivity and Impairment (WPAI) questionnaire



OA, osteoarthritis

- Total direct medical costs as well as component costs were significantly higher in the OA pain cohort across all provider visit categories (**Figure 5**)
  - Hospitalization costs accounted for slightly more than half of the direct costs: 51% and 55% for workers with OA pain and controls, respectively
  - Total direct medical costs were more than 1.5 times higher in the OA pain cohort ($3,702) than for controls ($2,158), (*P* <0.0001)
- Total costs in the OA pain cohort were 84% higher than the controls (*P* <0.0001; **Figure 5**)
  - The primary cost driver was indirect costs resulting from lost productivity, which accounted for approximately 75% of total costs in each cohort but was almost twice as high in the OA pain cohort relative to controls

FIGURE 5: Mean annual costs in the osteoarthritis (OA) pain and control cohorts



ED, emergency department

CONCLUSIONS

- A substantial proportion of workers suffer from OA pain
- OA pain has a profound impact on quality of life, work productivity, and health care resource use in the US workforce
- Total costs were primarily driven by indirect costs resulting from lost productivity, the majority of which was due to reduced productivity while at work (presenteeism)

REFERENCES

1. Centers for Disease Control and Prevention (CDC). *MMWR Morb Mortal Wkly Rep* 2009;58:421-6. **2.** Woolf AD, Pfleger B. *Bull World Health Organ* 2003;81:646-56. **3.** Leardini G, Salaffi F, Caporali R, et al. *Clin Exp Rheumatol* 2004;22:699-706. **4.** Rabenda V, Manette C, Lemmens R, et al. *J Rheumatol* 2006;33:1152-8. **5.** Gupta S, Hawker GA, Laporte A, et al. *Rheumatology (Oxford)* 2005;44:1531-7. **6.** Reilly MC, Zbrozek AS, Dukes EM. *Pharmacoeconomics* 1993;4:353-65. **7.** Ware JE Jr, Kosinski M, Turner-Bowker D, et al. *User's Manual for the SF-12v2® Health Survey With a Supplement Documenting SF-12® Health Survey*. Lincoln, RI: QualityMetric Inc; 2002. **8.** Brazier J, Roberts J, Deverill M. *J Health Econ* 2002;21:271-92. **9.** Lofland JH, Pizzi L, Frick KD. *Pharmacoeconomics* 2004;22:165-84.

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