# Supporting Self-Management Education for Arthritis: Evidence from the Arthritis Conditions and Health Effects Survey on the Influential Role of Health Care Providers

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## Abstract

**Objective:** Self-management education (SME) programs are recommended for many chronic conditions. We studied which adults with arthritis received a health care provider's recommendation (HCP) to take an SME class and who attended.

**Methods:** We analyzed data from a 2005/2006 national telephone survey of US adults with arthritis 45 years (n=1,793). We used multivariable-adjusted prevalence ratios (PR) from logistic regression models to estimate associations with: 1) receiving an HCP recommendation to take an SME class; and 2) attending an SME class.

**Results:** Among all adults with arthritis: 9.9% received an HCP recommendation to take an SME class; 9.7% attended an SME class. Of those receiving a recommendation, 52.0% attended an SME class. The strongest association with SME class attendance was an HCP recommendation to take one (PR=8.9; 95% CI=6.6–12.1).

**Conclusions:** For adults with arthritis, an HCP recommendation to take an SME class was strongly associated with SME class attendance. Approximately 50% of adults with arthritis have 1 other chronic condition; by recommending SME program attendance, HCPs may activate patients' self-management behaviors. If generalizable to other chronic conditions, this HCP recommendation could be a key influencer in improving outcomes for a range of chronic conditions and patients' quality of life.

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## Keywords

arthritis; self-management education; health care provider recommendations; activity limitations

Participation in self-management education (SME) programs (e.g., Chronic Disease Self-Management Program [CDSMP]) can confer many proven short-term and sustained benefits for adults with chronic conditions. For example, a 2013 meta-analysis of CDSMP outcomes, combining 23 randomized controlled trials (RCT) and longitudinal studies (published from 1999 to 2009), found short-term (4–6 months) and longer term (9–12 months) improvements in multiple outcomes including increased self-efficacy (confidence) and aerobic activity, and decreased depression. (1, 2)

Since 1999, the US Centers for Disease Control and Prevention (CDC) and the Administration for Community Living have invested millions of dollars in developing infrastructure to increase availability of evidence-based SME programs in communities in all states and the District of Columbia. (3–5) SME programs are conceptually appealing for adults with arthritis (6) and consistent with their desire for nonpharmacologic arthritis management strategies.(7) Despite the appeal, benefits, and increasing availability of SME programs, SME participation among US adults with arthritis has remained constant at 11% (age-standardized) since the early 2000s. (8) Results from two focus group studies suggest that adults with arthritis are unaware that SME programs exist. (9, 10) Specifically, none of the participants in either study mentioned SME programs when asked what would make their arthritis better (9) or what they do to manage their knee OA symptoms. (10) When individuals with arthritis learn about the existence of SME programs, they are surprised that they did not hear about these programs from their health care provider (HCP) or from other channels, such as advertising or articles, and report that they expect to learn about SME programs from their HCP. (9) This expectation is consistent with the emphasis on self-management support (i.e., actions to support individuals' self-management) in both the original and expanded Chronic Care Models (CCM). (11–13) The CCM is a framework that proposes roles for individuals, HCPs, health systems, and communities in improving care for those with chronic disease and, ultimately, the health of the population overall.

An HCP's recommendation to take an SME class likely increases SME attendance. In a 2017 Center for Medicaid and Medicare Services study of Medicare beneficiaries (n=8,686), the percentage of respondents expressing readiness to participate in a wellness program was 6 times higher for those who had received an HCP recommendation to engage in at least one of five self-management behaviors (i.e., eat healthily, lose weight, exercise, improve balance, and manage chronic conditions) than those not receiving a recommendation (86.0% and 14.0%, respectively).(14) Across beneficiaries, two-thirds of those with arthritis (67.2%) expressed readiness to participate in a wellness program, which was higher than readiness among those with diabetes (29.1%) and all beneficiaries (60.9%).

In 2018, using 2005/2006 Arthritis and Conditions Health Effects Survey (ACHES) data, we studied two questions related to SME participation. First, currently little is known about who with arthritis receives a recommendation from their HCP to take an SME class. Therefore, we examined the characteristics associated with receiving a recommendation to take an SME

class. Second, we examined characteristics associated with taking an SME class including the association between receiving an HCP recommendation and attending one. Throughout this report, we use "SME class" to refer to an SME class or course or program.

## Methods

### Study sample

ACHES was a random digit dialed national telephone survey conducted by the US CDC from June 2005 to April 2006 through a contract with Batelle, a research organization. The purpose of this cross-sectional survey was to measure the physical and psychosocial effects of arthritis and knowledge, attitudes, and behaviors about arthritis treatment and management. ACHES, based on a complex survey design, was designed to provide estimates that are representative of the civilian, non-institutionalized US population of adults age 45 years with arthritis and/or chronic joint symptoms.(15) The CDC Institutional Review Board approved the ACHES protocol (#1255) prior to survey administration. ACHES' methods are described futher elsewhere.(15)

ACHES was based on a stratified sampling design with oversampling of areas with high percentages of Hispanics and Non-Hispanic Blacks; additional details are in Appendix A. To maximize response rates, letters were mailed to addresses associated with potential residential phone numbers 2 weeks before the first call. Trained interviewers called each number to identify 1) residential numbers and 2) household members age 45 years-old with doctor-diagnosed arthritis or chronic joint symptoms. For this report, we included only those reporting doctor-diagnosed arthritis (n=1,793), hereafter "arthritis", who were identified with a response of "yes" to: "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?" Standardized interviews were conducted in English or Spanish.(15, 16) All residents in each household who met inclusion criteria were eligible; upon determining eligibility, interviewers read an informed consent statement to potential participants and data collection was conducted only among those who verbally consented to participate. ACHES participants were compensated with their choice of a pre-paid long distance phone card (100 minutes) or an Arthritis Foundation donation ($5). Among eligible households (i.e., households with 1 eligible household member), response and completion rates (Council on American Research Organizations) were 51% and 86%, respectively. Among eligible household members, response and completion (i.e., among those who responded, percentage completing survey) rates respectively were 31% and 75% for the first eligible household participant identified, and 16% and 80% for other eligible household respondents.

### Measures

#### Two outcomes were assessed:

**HCP recommendation to take an SME class :** We classified participants as having received an HCP recommendation to take an SME class if they responded "yes" to "Has a doctor or other health professional ever suggested taking a course or class to teach you how to manage problems related to your arthritis or joint symptoms?"

**SME class attendance:** SME class attendance was "yes" to "Have you ever taken a course or class to teach you how to manage problems related to your arthritis or joint symptoms?"

We examined the relationship of each of these two outcomes across five categories of variables: 1) socio-demographics; 2) arthritis symptoms; 3) current physical and mental health status; 4) arthritis-attributable effects; and 5) receipt of recommendations for other HCP self-management behaviors. The 16 variables in the five categories are described in Appendix A.

## Statistical analyses

All analyses accounted for ACHES' complex design, including application of sampling weights, and were conducted using SAS version 9.3(17) and SUDAAN version 11.(18)

**Descriptive analysis:** First, we calculated the distribution of all variables described above using percentages and 95% confidence intervals (CI). Next, we estimated prevalence, across these characteristics, of: 1) "receiving an HCP recommendation to take an SME class"; and 2) "attending an SME class".

**Regression analyses—**We estimated associations with prevalence ratios (PR) and 95% confidence intervals in univaraiable and multivariable logistic regression models.(19) Further details on the methods for modeling are in Appendix A.

## Results

### Distribution of characteristics in 2005/06 ACHES population:

Approximately half of the study population was age 45–64 years (54.1%) and had greater than a high school education (52.2%) (Table 1). The majority were women (61.0%), Non-Hispanic (N-H) Whites (80.5%) and not employed (25.9%) or retired (40.8%). Severe arthritis symptoms were common with 29.4%, 28.6%, and 27.6% reporting severe joint pain, stiffness, and fatigue in the past 7 days, respectively. Approximately a third (34.1%) rated their health as fair or poor; 30.5% had probable anxiety; 17.5% had probable depression; and a third (33.8%) were obese (body mass index 30). Slightly more than half (52.3%) reported being arthritis-attributable activity limitations (AAAL); 30.6% reported that arthritis interfered with their ability to work for pay; and 21.8% reported that arthritis had interfered "a lot" with errands or shopping in the past 7 days. Receiving an HCP recommendation varied widely by self-management behavior: 9.9% had received a recommendation to take an SME class; 36.4% received a recommendation to lose weight; and 61.0% received a recommendation to exercise to manage arthritis. Last, 9.7% reported ever attending an SME class; among those who received a recommendation, 52.0% attended an SME class.

### Outcome 1: Received an HCP recommendation to take an SME class:

Across the characteristics examined, the six subgroups with the highest prevalence ( 15%) of receiving such a recommendation were those with an arthritis-attributable interference (errands or shopping in past 7 days [18.0%] or ability to work for pay [17.2%]), those who

had received HCP support for other self-management behaviors (recommendation to lose weight (16.7%) or to engage in physical activity/exercise [15.2%]), N-H blacks (15.8%); and those with fair/poor general health status (15.3%) (Table 2).

The five subgroups with the lowest prevalence (<8%) of receiving a recommendation were those who had never received a recommendation to engage in physical activity/exercise to manage arthritis (1.9%), reported no to low joint pain in past 7 days (5.3%), no to low fatigue in the past 7 days (6.6%), or no to low stiffness in the past 7 days (6.8%), and those with less than a high school education (7.9%) (Table 2).

In unadjusted logistic regression analyses, based on the Wald F statistic, 11 of the 17 variables were significantly associated with ever receiving a recommendation (Table 2); the six exceptions were age, sex, race/ethnicity, education, employment status, and depression. The strongest unadjusted association was for receiving a recommendation to engage in physical activity/exercise (PR=8.1; 95% CI=4.6–14.4).

In the final multivariable model, four characteristics were significantly associated with receiving an HCP recommendation to take an SME class: receiving a recommendation to engage in physical activity/exercise (PR=5.7; 95% CI=3.2–10.1); receiving a recommendation to lose weight (PR=1.8; 95% CI=1.3–2.4); reporting that arthritis affected ability to work for pay (PR=1.7; 95% CI=1.2–2.3); and reporting that arthritis interfered with errands or shopping in the past 7 days (PR=1.6; 95% CI=1.2–2.3) (Table 2).

### Outcome 2: Ever attended an SME class:

Across the characteristics examined, the highest prevalence of SME class attendance was by far among those receiving a recommendation to take an SME class (48.0%) (Table 3). For the remaining characteristics, attending an SME class was lowest among those with less than a high school education (4.7%) and highest among those reporting that arthritis interfered with errands and shopping in the past 7 days (16.0%).

In unadjusted logistic regression analyses, six of the 16 characteristics examined were significantly associated with attending an SME class: receiving an HCP recommendation to take an SME class, highest educational attainment, severity of joint pain in past 7 days, AAAL, arthritis affected ability work for pay, and arthritis interfered with errands or shopping in the past 7 days (Table 3).

In the final multivariable model, of the four characteristics associated with taking an SME class, the strongest association was with receiving an HCP recommendation to attend a class (PR=8.9; 95% CI=6.6–12.1) (Table 3). SME class attendance rose with increasing educational attainment (PRs range=1.5 [high school graduate] to 2.7 [ university degree]; referent: < high school education). Last, those who reported having an AAAL were 1.5 times more likely to have attended (referent: without AAAL) and older adults ( 65 years) were 1.4 times more likely to have attended than their middle age counterparts (45–64 years).

## Discussion

In the ACHES study population, only one in 10 adults with arthritis 45 years reported receiving an HCP recommendation to take an SME class. Why such a low percentage received this recommendation is unclear. In multivariable analyses, two types of characteristics were associated with receiving a recommendation to take an SME program: receiving an HCP recommendation for other self-management behaviors and arthritis-attributable interferences. The associations with receiving an HCP recommendation for other self-management behaviors (i.e., physical activity/exercise and weight loss) demonstrate that some adults with arthritis receive multiple self-management support messages from their HCPs; however, a considerably higher percentage received HCP recommendations for physical activity/exercise (61.0%) and weight loss (36.4%) compared with SME programs. The association between an HCP recommendation and arthritis-attributable important life domains (work and household management) but lack of association with the generic non-specific arthritis-attributable effect, AAAL, suggests that individuals with arthritis generally receive recommendations to take an SME class after arthritis has consequential effects. Adults with arthritis typically do not take action on their arthritis until it begins to affect some meaningful aspect of daily activities and/or routines.(7) If patients do not seek attention for their arthritis until it interferes substantially, HCPs are unable to make this recommendation before substantial interference begins. Alternatively, patients may seek care when they have milder functional limitations, but HCPs may perceive that SME classes are unnecessary until there is significant disease interference. Or, HCPs may be addressing their patients' concerns about arthritis in other ways such as prescribing pain medications and recommending self-management behaviors such as physical activity and weight management (20) but are not recommending SME programs because they are unaware of them.

Those who received a recommendation to take an SME class were almost 9 times (multivariable PR=8.9) more likely to attend an SME class than those not receiving a recommendation. This suggests HCPs' recommendations activate patients and that addressing barriers to recommendations is a critical step in increasing attendance. Adding information about SME program content and effectiveness to academic and continuing education curriculum and outreach can increase HCPs' awareness of, and confidence in, these programs. Information about SME programs for HCPs would ideally discuss SME programs that have a strong evidence base such as the CDSMP(1, 2) and HCPs' highly influential role in activating readiness for (14), and attendance at, SME programs. HCPs may want to consider evidence-based SME programs like CDSMP as an important activation tool leading to wide-ranging behavior changes for managing multiple chronic conditions. For example, CDSMP participation leads to sustained increases in aerobic activity which is beneficial for managing several chronic conditions including heart disease, diabetes, and depression. (1) Additionally, CDSMP may be especially beneficial for individuals with multiple chronic conditions; at least one study – a secondary analysis of an CDSMP RCT - found those with multiple physical conditions and probable depression experienced the greatest improvements in vitality, health-related quality of life, and mental

well-being. (21) Health systems can help HCPs incorporate referrals to SME classes into clinical practice by building reminders into electronic clinical decision making tools.

The association between taking an SME class with increasing educational attainment and AAAL is consistent with previous findings. (1, 8) Interestingly, having an AAAL was associated with increased probability of attending an SME class, but the chance of receiving a recommendation was higher among those with arthritis-attributable effects on important life domains (working and household management). As discussed above, individuals with arthritis typically do not act on their arthritis until it adversely affects their lives; the increased attendance among those with any limitation in activity suggests that individuals may be receptive to a recommendation upon onset of any limitation. The relationship between HCP's recommendation to take an SME class and attending one is of interest to many stakeholders, including public health programs, which recommend greater HCP referrals to underused evidence-based, community-delivered programs that improve patints' quality of life.

### Limitations

This study has at least four limitations. First, while ACHES was developed to represent US adults with arthritis age 45 in the civilian, non-institutionalized population, the generalizability to the current population of adults with arthritis is unknown because ACHES was conducted in 2005/06. Additionally, the applicability to younger adults (18–44 years) is unclear. Although we do not know whether the percentage of HCPs recommending SME classes has changed, we believe the association between HCP recommendations and SME program attendance would apply today because HCPs' recommendations have been reported to lead to other behavior changes, such as weight loss (22) and smoking cessation. (23) We do know that the prevalence of SME class attendance among people with arthritis in the 2014 US National Health Interview Survey, based on the same question, was similar to ACHES: 12.1% and 10.5% for 45–64 and 65 years, respectively. (8) Second, all information was based on self-report and is susceptible to misclassification. Third, ACHES is a cross-sectional study, and the temporal sequence of the characteristics and outcomes is unknown . Fourth, despite multiple strategies to maximize survey participation, especially for N-H Blacks and Hispanics, response rates were low.

This study's strengths include the use of data from the most comprehensive population-based survey of US adults with arthritis which measured characteristics not collected elsewhere. The range of characteristics measured allowed examination of two research questions that include clinically and personally relevant potential associations.

### Conclusions

Our findings suggest that some adults with arthritis are receiving advice from their HCPs on multiple aspects of arthritis self-management. We were unable to assess whether this information was from the same HCPs, but we found that there are HCPs who are aware of these strategies and are recommending them. Adults with arthritis were more likely to have received the recommendation to take an SME class when their ability to engage in work and household management activities was challenged. The strong multivariable

association (PR=8.9) between receiving an HCP recommendation to take an SME class and attending one illustrates the considerable influence of HCPs on SME class attendance, with their recommendation having, by far, the strongest association with attending an SME class of any characteristic we studied. HCPs are positioned to help their patients make meaningful changes in their health status and quality-of-life by recommending SME program participation as part of routine patient care. Incorporating this message into usual care is appropriate because qualitative evidence indicates that individuals with arthritis expect to hear about these programs from their HCPs and the increased SME attendance among those with any limitation observed in this and other studies suggests that people would be interested in attending a program before onset of substantial limitations. (8) The HCPs' role in providing both self-management support and connecting patients to community resources (e.g., SME programs) is an intrinsic component of both the original and enhanced Chronic Care Model.(11, 12) Follow-up conversations about these recommendations may emphasize the importance of these self-management behaviors and provide an opportunity for HCPs to engage in shared goal-setting and decision-making with their patients to make these self-management behaviors attainable.

## Appendix A: Additional details on study methods

### 1. ACHES sampling frame

ACHES sampling included oversampling of areas with high percentages of Hispanics and Non-Hispanic (N-H) Blacks. These two race/ethnic groups represent a smaller percentage of the US population and can have lower response rates. This sampling strategy was used to increase the number of individuals from these two groups in the ACHES sample and thus ability to generate reliable estimates. ACHES sampling weight calculations included adjustment for non-response and oversampling and calibrated the sample to the age-, sex-, and race/ethnic- distribution of the US non-institutionalized civilian population of adults with arthritis which was estimated from the 2003–2005 National Health Interview Survey. (1)

### 2. Description of characteristics studied.

Socio-demographic characteristics were age, sex, race/ethnicity, highest educational attainment, and employment status (employed, not working [out of work, homemaker, student, unable to work/disabled], or retired).

Participants rated the severity of each of three arthritis symptoms (joint pain and aching, joint stiffness, and fatigue) in the past 7 days on a scale of 0 to 10 (0=no symptoms, 10=most severe). For each symptom, we categorized ratings into 3 levels: none to low (0–4), moderate (5–6), and severe (7–10) (2). Self-rated health was measured with "Would you say your health in general is excellent, very good, good, fair, or poor?" and categorized into three groups (very good/excellent, good, or poor/fair). Anxiety and depression were measured using the Arthritis Impacts Measurement Scales (AIMS), where a score of 4 on each of the anxiety and depression scales indicated the presence of probable anxiety or depression, respectively. (3–6) Body mass index (BMI) (kilogram/meter$^2$) was categorized

as under or normal weight (<25), overweight (25-<30), or obese (  30) based on self-reported weight and height.

Those responding "yes" to "Are you limited in any way in any of your usual activities because of arthritis or joint symptoms" were classified as having an arthritis-attributable activity limitation (AAAL). A response of "yes" to "Do arthritis or joint symptoms now affect whether you work for pay or not?" indicated that arthritis affected ability to work for pay. Participants also rated how much arthritis-attributable interference (not at all, a little, a lot) that they experienced in the past seven days in errands and shopping; we examined this as "not at all/a little" versus "a lot".

We defined other HCP self-management behavior support as receipt of physician counselling for physical activity and weight loss. Respondents were classified as having received a recommendation to exercise to manage arthritis if they responded "yes" to "Has a doctor or other health professional ever suggested physical activity or exercise to help your arthritis or joint symptoms?" and as having received a recommendation to lose weight to manage arthritis if they responded "yes" to "Has a doctor or other health professional ever suggested losing weight to help your arthritis or joint symptoms?" We included all ACHES respondents (i.e., did not restrict to those who were overweight or obese) in analysis involving "recommendation to lose weight" because this question's time frame was "ever" and this variable was included to understand the level of self-management support that adults with arthritis have ever received; conceivably some respondents who were under or normal weight at the time of the ACHES survey had lost weight in response to this recommendation.

## Univariable and multivariable logistic regression modelling

### Outcome 1: Received an HCP recommendation to take an SME class:

First, we estimated unadjusted associations between "ever received a recommendation" and each of 16 characteristics (socio-demographics, arthritis symptoms, current health status, arthritis-attributable effects and the additional two HCP self-management support variables [recommendation for physical activity/exercise; recommendation to lose weight]). Then, we conducted multivariable modeling using forward manual stepwise selection procedures. We identified statistically significant associations ($\alpha$=0.05) with ever receiving a recommendation to take an SME class using the Wald F statistic with Satterwaite adjustment and associated p-values.(7) For each multivariable model, we calculated the Condition Index to detect collinearity where a Condition Index   30 may indicate collinearity.(8)

### Outcome 2: Attended an SME class:

We estimated unadjusted associations between "ever attending an SME class " and 17 characteristics ("ever received recommendation to take an SME class" and the 16 socio-demographic, arthritis symptoms, current health status and arthritis-attributable effects variables). Next, we used the same procedures for multivariable analyses as for Outcome 1.

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**Table 1:**

Characteristics of adults with arthritis in 2005/06 Arthritis Conditions Health Effects Survey (n=1,793)

| | Number of respondents reporting characteristic (unweighted) | % (weighted) | 95% CI |
|---|---|---|---|
| **Socio-demographics** | | | |
| Age (years) | | | |
| 45–54 | 468 | 25.1 | (22.8 – 27.5) |
| 55–64 | 538 | 29.0 | (26.6 – 31.5) |
| 65–74 | 449 | 26.8 | (24.4 – 29.3) |
| 75 | 314 | 19.1 | (17.1 – 21.4) |
| Sex | | | |
| Men | 550 | 39.0 | (36.6 – 41.5) |
| Women | 1,243 | 61.0 | (58.5 – 63.4) |
| Race/ethnicity | | | |
| Hispanic | 114 | 6.3 | (5.0 – 7.8) |
| Non-Hispanic Black | 207 | 9.7 | (8.4 – 11.1) |
| Non-Hispanic Other | 66 | 3.5 | (2.7 – 4.6) |
| Non-Hispanic White | 1,363 | 80.5 | (78.5 – 82.4) |
| Highest educational attainment | | | |
| Less than high School | 286 | 15.6 | (13.8 – 17.6) |
| High School graduate | 558 | 32.1 | (29.7 – 34.7) |
| Technical college/some university | 473 | 25.2 | (23.1 – 27.5) |
| At least university degree | 472 | 27.0 | (24.7 – 29.6) |
| Employment status | | | |
| Employed | 597 | 33.3 | (30.8 – 35.9) |
| Not working [*] | 503 | 25.9 | (23.8 – 28.2) |
| Retired | 691 | 40.8 | (38.1 – 43.5) |
| **Arthritis symptoms** | | | |
| Severity of joint pain in past 7 days | | | |
| None to low (0–4) | 696 | 40.4 | (37.8 – 43.0) |
| Moderate (5–6) | 543 | 30.2 | (27.9 – 32.6) |
| Severe ( 7) | 546 | 29.4 | (27.1 – 31.9) |
| Severity of stiffness in past 7 days | | | |
| None to low (0–4) | 767 | 45.1 | (42.5 – 47.8) |
| Moderate (5–6) | 480 | 26.2 | (24.0 – 28.6) |
| Severe ( 7) | 529 | 28.6 | (26.4 – 31.0) |
| Severity of fatigue in past 7 days | | | |
| None to low (0–4) | 867 | 51.0 | (48.4 – 53.7) |
| Moderate (5–6) | 378 | 21.4 | (19.3 – 23.6) |
| Severe ( 7) | 507 | 27.6 | (25.4 – 30.0) |

| | Number of respondents reporting characteristic (unweighted) | % (weighted) | 95% CI |
|---|---|---|---|
| **Current health status** | | | |
| Self-rated general health | | | |
|     Very good/excellent | 584 | 34.0 | (31.4 – 36.6) |
|     Good | 580 | 32.0 | (29.6 – 34.4) |
|     Poor/fair | 624 | 34.1 | (31.6 – 36.6) |
| Anxiety | | | |
|     No | 1,221 | 69.5 | (67.0 – 71.9) |
|     Yes | 557 | 30.5 | (28.1 – 33.0) |
| Depression | | | |
|     No | 1,451 | 82.5 | (80.4 – 84.4) |
|     Yes | 330 | 17.5 | (15.6 – 19.6) |
| Body mass index (kilograms/meters$^2$) | | | |
|     Under and normal weight (< 25) | 527 | 29.3 | (27.0 – 31.8) |
|     Overweight (25 - <30) | 597 | 36.9 | (34.4 – 39.4) |
|     Obese ( 30) | 620 | 33.8 | (31.4 – 36.4) |
| **Arthritis-attributable effects** | | | |
| Limited in any way because of arthritis or joint symptoms (AAAL) | | | |
|     No | 834 | 47.7 | (45.1 – 50.3) |
|     Yes | 956 | 52.3 | (49.7 – 54.9) |
| Arthritis affects ability to work for pay | | | |
|     No | 1,209 | 69.4 | (67.0 – 71.8) |
|     Yes | 555 | 30.6 | (28.2 – 33.0) |
| Arthritis interfered with errands or shopping in past 7 days | | | |
|     A little/none | 1,363 | 78.2 | (76.1 – 80.2) |
|     A lot | 421 | 21.8 | (19.8 – 23.9) |
| **Self-management recommendations and SME class attendance** | | | |
| Ever received an HCP recommendation to attend an SME course or class | | | |
|     No | 1,613 | 90.1 | (88.4 – 91.5) |
|     Yes | 177 | 9.9 | (8.5 – 11.6) |
| Has a doctor or other health professional ever suggested losing weight to manage your arthritis or joint symptoms? | | | |
|     No | 1,108 | 63.6 | (61.0 – 66.1) |
|     Yes | 682 | 36.4 | (33.9 – 39.0) |
| Has a doctor or other health professional ever suggested exercise to manage your arthritis or joint symptoms? | | | |
|     No | 680 | 39.0 | (36.5 – 41.6) |
|     Yes | 1,106 | 61.0 | (58.4– 63.5) |
| Ever attended a class or course to management arthritis symptoms? | | | |
|     No | 1,616 | 90.3 | (88.6 – 91.7) |

| | Number of respondents reporting characteristic (unweighted) | % (weighted) | 95% CI |
|---|---|---|---|
| Yes | 176 | 9.7 | (8.3 – 11.4) |

*
Respondents who were out of work (unemployed), homemakers, students, or unable to work/disabled

ACHES, Arthritis Conditions and Health Effects Survey; SME, self-management education; CI, confidence interval

**Table 2:**

Unadjusted prevalence of, and prevalence ratios (unadjusted and multivariable adjusted) for associations with, ever receiving a health care provider recommendation to attend an SME program, 2005–2006 Arthritis and Conditions Health Effects Survey

| | | | Prevalence ratios | | | |
|---|---|---|---|---|---|---|
| | **Prevalence** | | **Unadjusted** | **95% CI** | **Multivariable adjusted** [§] | **95% CI** |
| | % | 95% CI | | | | |
| **Overall** | 9.9 | (8.5 – 11.6) | - | - | | |
| **Socio-demographics** | | | | | | |
| Age (years) [*] | | | | | | |
| 45–64 | 11.3 | (9.2 – 13.7) | 1.0 | | | |
| 65 | 8.4 | (6.5 – 10.8) | 0.7 | (0.5 – 1.0) | | |
| Sex | | | | | | |
| Men | 9.1 | (6.8 – 12.1) | 1.0 | | | |
| Women | 10.5 | (8.7 – 12.5) | 1.1 | (0.8 – 1.6) | | |
| Race/Ethnicity | | | | | | |
| Hispanic | 10.2 | (5.1 – 19.4) | 1.1 | (0.5 – 2.2) | | |
| Non-Hispanic Black | 15.8 | (10.7 – 22.7) | 1.7 | (1.1 – 2.6) | | |
| Non-Hispanic Other | [†] | | 1.3 | (0.6 – 2.7) | | |
| Non-Hispanic White | 9.2 | (7.6 – 11.0) | 1.0 | | | |
| Highest educational attainment | | | | | | |
| Less than high School | 7.9 | (5.2 – 11.9) | 1.0 | | | |
| High School graduate | 10.9 | (8.3 – 14.1) | 1.4 | (0.8 – 2.2) | | |
| Technical college/some university | 10.6 | (7.9 – 14.2) | 1.3 | (0.8 – 2.2) | | |
| At least university degree | 9.5 | (6.9 – 12.8) | 1.2 | (0.7 – 2.0) | | |
| Employment status | | | | | | |
| Employed | 8.6 | (6.3 – 11.6) | 1.0 | | | |
| Not working [†] | 12.9 | (10.0 – 16.6) | 1.5 | (1.0 – 2.2) | | |
| Retired | 9.2 | (7.1 – 11.8) | 1.1 | (0.7 – 1.6) | | |

| | Prevalence | 95% CI | Prevalence ratios | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Unadjusted | 95% CI | | Multivariable adjusted § | 95% CI |
| **Arthritis symptoms** | | | | | | | |
| Severity of joint pain in past 7 days | | | | | ‡ | | |
| None to low (0–4) | 5.3 | (3.7 – 7.5) | 1.0 | | | | |
| Moderate (5–6) | 11.7 | (9.0 – 15.2) | 2.2 | (1.4 – 3.4) | | | |
| Severe (≥ 7) | 14.3 | (11.4 – 17.9) | 2.7 | (1.8 – 4.1) | | | |
| Severity of stiffness in past 7 days | | | | | ‡ | | |
| None to low (0–4) | 6.8 | (5.0 – 9.0) | 1.0 | | | | |
| Moderate (5–6) | 12.4 | (9.4 – 16.3) | 1.8 | (1.2 – 2.7) | | | |
| Severe (≥ 7) | 13.1 | (10.2 – 16.6) | 1.9 | (1.3 – 2.8) | | | |
| Severity of fatigue in past 7 days | | | | | ‡ | | |
| None to low (0–4) | 6.6 | (5.0 – 8.8) | 1.0 | | | | |
| Moderate (5–6) | 12.3 | (9.0 – 16.4) | 1.9 | (1.2 – 2.8) | | | |
| Severe (≥ 7) | 14.8 | (11.6 – 18.6) | 2.2 | (1.5 – 3.2) | | | |
| **Current health status** | | | | | | | |
| Self-rated general health | | | | | ‡ | | |
| Very good/excellent | 7.1 | (5.1 – 9.9) | 1.0 | | | | |
| Good | 7.2 | (5.2 – 10.0) | 1.0 | (0.6 – 1.6) | | | |
| Poor/fair | 15.3 | (12.4 – 18.8) | 2.1 | (1.5 – 3.2) | | | |
| Anxiety | | | | | ‡ | | |
| No | 8.2 | (6.6 – 10.0) | 1.0 | | | | |
| Yes | 13.8 | (10.9 – 17.3) | 1.7 | (1.2 – 2.3) | | | |
| Depression | | | | | | | |
| No | 9.3 | (7.7 – 11.2) | 1.0 | | | | |
| Yes | 13.0 | (9.7 – 17.3) | 1.4 | (1.0 – 2.0) | | | |
| Body mass index (kilograms/meters$^2$) | | | | | ‡ | | |
| Under and normal weight ($<$ 25) | 8.8 | (6.4 – 12.0) | 1.0 | | | | |
| Overweight (25 – $<$30) | 7.7 | (5.6 – 10.4) | 0.9 | (0.6 – 1.4) | | | |

| | Prevalence | | Prevalence ratios | | | |
|---|---|---|---|---|---|---|
| | | | Unadjusted | 95% CI | Multivariable adjusted § | 95% CI |
| Obese (≥30) | 13.4 | (10.7 – 16.7) | 1.5 | (1.0 – 2.2) | | |
| Limited in any way because of arthritis or joint symptoms (AAAL) | | | | ‡ | | |
| No | 6.9 | (5.1 – 9.3) | 1.0 | | | |
| Yes | 12.7 | (10.6 – 15.2) | 1.8 | (1.3 – 2.6) | | |
| Arthritis affected ability to work for pay | | | | ‡ | | |
| No | 6.8 | (5.4 – 8.6) | 1.0 | | 1.0 | |
| Yes | 17.2 | (13.9 – 20.9) | 2.5 | (1.8 – 3.4) | 1.7 | (1.2 – 2.3) |
| Arthritis interfered with errands or shopping in past 7 days | | | | ‡ | | |
| A little/none | 7.6 | (6.1 – 9.3) | 1.0 | | 1.0 | |
| A lot | 18.0 | (14.3 – 22.5) | 2.4 | (1.7 – 3.2) | 1.6 | (1.2 – 2.3) |
| **Self-management support** | | | | | | |
| Has a doctor or other health professional ever suggested losing weight to manage your arthritis or joint symptoms? | | | | ‡ | | |
| No | 6.0 | (4.7 – 7.7) | 1.0 | | 1.0 | |
| Yes | 16.7 | (13.8 – 20.2) | 2.8 | (2.0 – 3.8) | 1.8 | (1.3 – 2.4) |
| Has a doctor or other health professional ever suggested physical activity or exercise to manage your arthritis or joint symptoms? | | | | ‡ | | |
| No | 1.9 | (1.1 – 3.2) | 1.0 | | 1.0 | |
| Yes | 15.2 | (13.0 – 17.7) | 8.1 | (4.6 – 14.4) | 5.7 | (3.2 – 10.1) |

*
Age was aggregated into two levels because there was insufficient sample size to generate statistically precise estimates for a four level age variable in the multivariable analysis; prevalence of receiving a recommendation was 12.5% (95% CI=9.4 – 16.4), 10.3% (95% CI=7.7–13.6), 8.5% (95% CI=6.1–11.8), and 8.2% (95%=5.4–12.2) for ages 45–54, 55–64, 65–74, and 75 years, respectively.

†
Prevalence suppressed because relative standard error ≥ 30.0%.

‡
Respondents who were out of work (unemployed), homemakers, students, or unable to work/disabled.

‡
Characteristics with a statistically significant Wald F statistic (alpha=0.05) in univariable models.

§
Multivariable model contained characteristics that had statistically significant Wald F statistic (alpha=0.05) for association with receiving a Health Care Provider recommendation to attend an SME program; the condition index for this model was 14.1, indicating no evidence of collinearity.

SME, self-management education; PR, prevalence ratio; CI, confidence interval

**Table 3:**

Unadjusted prevalence of, and prevalence ratios (unadjusted and multivariable adjusted) for associations with, ever attending an SME program, 2005–2006 Arthritis Conditions Health Effects Survey

| | Prevalence | | Prevalence ratios | | | |
| | % | 95% CI | Unadjusted | 95% CI | Multivariable adjusted[§] | 95% CI |
|---|---|---|---|---|---|---|
| **Overall** | 9.7 | (8.3 – 11.4) | - | - | - | - |
| **Socio-demographics** | | | | | | |
| Age (years) | | | | | | |
| 45–64 | 9.5 | (7.6 – 11.7) | 1.0 | | 1.0 | |
| 65 | 9.9 | (7.8 – 12.5) | 1.0 | (0.8 – 1.4) | 1.4 | (1.0 – 1.8) |
| Sex | | | | | | |
| Men | 8.4 | (6.2 – 11.3) | 1.0 | | | |
| Women | 10.6 | (8.8 – 12.6) | 1.3 | (0.9 – 1.8) | | |
| Race/Ethnicity | | | | | | |
| Hispanic | 14.7 | (7.6 – 26.6) | 1.6 | (0.8 – 3.0) | | |
| Non-Hispanic Black | 11.6 | (7.4 – 17.7) | 1.2 | (0.8 – 2.0) | | |
| Non-Hispanic Other | * | | 0.6 | (0.2 – 1.7) | | |
| Non-Hispanic White | 9.3 | (7.8 – 11.1) | 1.0 | | | |
| Highest educational attainment | | | | [‡] | | |
| Less than high School | 4.7 | (2.8 – 7.7) | 1.0 | | 1.0 | |
| High School graduate | 8.3 | (6.1 – 11.2) | 1.8 | (1.0 – 3.2) | 1.5 | (0.8 – 2.2) |
| Technical college/some university | 10.7 | (7.8 – 14.5) | 2.3 | (1.3 – 4.2) | 2.0 | (1.1 – 3.5) |
| At least university degree | 12.9 | (9.9 – 16.7) | 2.8 | (1.6 – 4.9) | 2.7 | (1.6 – 4.6) |
| Employment status | | | | | | |
| Employed | 7.8 | (5.8 – 10.5) | 1.0 | | | |
| Not working[†] | 10.4 | (7.8 – 13.8) | 1.3 | (0.9 – 2.0) | | |
| Retired | 10.9 | (8.5 – 13.8) | 1.4 | (1.0 – 2.0) | | |

| | Prevalence | | Unadjusted | 95% CI | Multivariable adjusted[§] | 95% CI |
|---|---|---|---|---|---|---|
| | | | | | Prevalence ratios | |
| **Arthritis symptoms** | | | | | | |
| Severity of joint pain in past 7 days | | | | | [‡] | |
| None to low (0–4) | 7.8 | (5.9 – 10.2) | 1.0 | | | |
| Moderate (5–6) | 9.7 | (7.1 – 13.0) | 1.2 | (0.8 – 1.8) | | |
| Severe ( 7) | 12.6 | (9.8 – 16.0) | 1.6 | (1.1 – 2.3) | | |
| Severity of stiffness in past 7 days | | | | | | |
| None to low (0–4) | 8.3 | (6.5 – 10.6) | 1.0 | | | |
| Moderate (5–6) | 10.0 | (7.3 – 13.5) | 1.2 | (0.8 – 1.8) | | |
| Severe ( 7) | 12.0 | (9.2 – 15.6) | 1.5 | (1.0 – 2.1) | | |
| Severity of fatigue in past 7 days | | | | | | |
| None to low (0–4) | 8.4 | (6.6 – 10.7) | 1.0 | | | |
| Moderate (5–6) | 11.2 | (8.2 – 15.0) | 1.3 | (0.9 – 2.0) | | |
| Severe ( 7) | 11.4 | (8.6 – 15.0) | 1.4 | (1.0 – 1.9) | | |
| **Current health status** | | | | | | |
| Self-rated general health | | | | | | |
| Very good/excellent | 8.5 | (6.4 – 11.2) | 1.0 | | | |
| Good | 9.0 | (6.7 – 12.1) | 1.0 | (0.7 – 1.6) | | |
| Poor/fair | 11.6 | (8.9 – 14.9) | 1.3 | (0.9 – 2.0) | | |
| Anxiety | | | | | | |
| No | 9.2 | (7.5 – 11.1) | 1.0 | | | |
| Yes | 11.0 | (8.4 – 14.3) | 1.2 | (0.9 – 1.6) | | |
| Depression | | | | | | |
| No | 9.3 | (7.7 – 11.1) | 1.0 | | | |
| Yes | 12.2 | (8.8 – 16.7) | 1.3 | (0.9 – 1.9) | | |
| Body mass index (kilograms/meters$^2$) | | | | | | |
| Under and normal weight ($<$ 25) | 9.3 | (6.9 – 12.5) | 1.0 | | | |
| Overweight (25 – <30) | 8.5 | (6.4 – 11.3) | 0.9 | (0.6 – 1.4) | | |

| | Prevalence | | Prevalence ratios | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | | | Unadjusted | 95% CI | Multivariable adjusted§ | 95% CI |
| Obese (≥30) | 11.5 | (9.0 – 14.7) | 1.2 | (0.8 – 1.8) | | |
| **Interference** | | | | | | |
| Limited in any way because of arthritis or joint symptoms (AAAL) | | | | | | |
| No | 6.6 | (5.0 – 8.6) | 1.0 | ‡ | 1.0 | |
| Yes | 12.4 | (10.2 – 15.0) | 1.9 | (1.4 – 2.6) | 1.5 | (1.1 – 2.1) |
| Arthritis affected ability to work for pay | | | | | | |
| No | 7.6 | (6.2 – 9.3) | 1.0 | ‡ | | |
| Yes | 14.2 | (11.1 – 17.9) | 1.9 | (1.4 – 2.5) | | |
| Arthritis interfered with errands or shopping in past 7 days | | | | | | |
| A little/none | 8.0 | (6.5 – 9.8) | 1.0 | ‡ | | |
| A lot | 16.0 | (12.4 – 20.4) | 2.0 | (1.4 – 2.8) | | |
| Ever received a recommendation to attend an SME course or class | | | | | | |
| No | 5.5 | (4.3 – 7.0) | 1.0 | ‡ | 1.0 | |
| Yes | 48.0 | (39.8 – 56.3) | 8.6 | (6.4 – 11.5) | 8.9 | (6.6–12.1) |

Age was aggregated into two levels because there was insufficient sample size to generate statistically precise estimates for a four level age variable in the multivariable analysis; prevalence of receiving a recommendation was 9.5% (95% CI=7.0 – 12.7), 9.5% (95% CI=6.9–12.8), 10.7% (95% CI=8.0–14.3), and 8.7% (95%=5.7–12.9) for ages 45–54, 55–64, 65–74, and 75 years, respectively.

†Prevalence suppressed because relative standard error ≥30.0%.

‡Respondents who were out of work (unemployed), homemakers, students, or unable to work/disabled.

§Characteristics with a statistically significant Wald F statistic (alpha=0.05) in univariable models.

∥Multivariable model contained characteristics that had statistically significant Wald F statistic (alpha=0.05) for association with with ever attending an SME program; the Condition Index for the model containing the four variables presented above was 22.0, indicating no evidence of collinearity.

SME, self-management education; PR, prevalence ratio; CI, confidence interval