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Report from the CDC

Arthritis Burden and Impact Are Greater among U.S. Women than Men: Intervention Opportunities

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ABSTRACT

Objectives: **To summarize arthritis burden and impact among women compared with men, using updated surveillance and impact measures; to describe public health approaches to arthritis; and to review effective, evidence-based arthritis self-management interventions.**

Results: **Arthritis continues to burden the U.S. population as the leading cause of physical disability and affects women disproportionately: women with arthritis report greater prevalence of activity and work limitations, psychological distress, and severe joint pain than their male counterparts. Three main public health interventions can reduce arthritis impact: self-management education, physical activity, and weight management. Self-management education programs are proven to reduce pain and depression, delay disability, improve self-efficacy, physical function, and quality of life, and reduce healthcare costs. Appropriate physical activity decreases pain, improves function, and delays disability. The American College of Rheumatology recommends maintaining a healthy weight to benefit patients with hip or knee osteoarthritis. Women appear more receptive to certain information delivery methods (i.e., physician counseling) than men, suggesting gender-specific targeting of interventions may be of use.**

Conclusions: **Effective interventions remain underused. The Centers for Disease Control and Prevention Arthritis Program and its partners, including state arthritis programs, continue their efforts to build the arthritis public health science base, monitor burden and impact, evaluate and disseminate evidence-based interventions, and work to decrease and delay disability, and increase quality of life among those with arthritis. As new approaches are developed, women and other disproportionately impacted groups merit particular consideration in tailoring and delivering programs to reduce arthritis burden.**

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The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

INTRODUCTION

The early Paleolithic era, about 2.5 million years ago, marked the beginning of a period of astonishing human technological development and some of the earliest ancestors in whom we see ourselves. These hominids introduced the first stone tools, controlled fire, stored food, and like many of us, suffered from arthritis.[1] Arthritis, a term used to define over 100 diseases and rheumatic conditions, today affects an estimated 46.4 million adults in the United States, of whom 61% (28.3 million) are women.[2] By the year 2030, arthritis, along with associated burdens, is projected to affect an estimated 67 million U.S. adults, including 40.9 million women.[3]

Far from being benign, many forms of arthritis have been identifiable for millennia, as evident in archaeological records of deformed bones, abnormal growths, and joint surface degeneration. This physical evidence, especially when combined with artistic or literary accounts, offers us a window on cultural adaptations, hierarchical gender systems, and general standards of living in ancient societies.[4] For example, one researcher of ancient Egypt observed that "a woman whose mobility was impaired might have been able to continue weaving cloth but not to sell it in person at the market, whereas a woman with arthritis in her hands would have had difficulty weaving but would have been able to work as a mourner or cultic singer."[5]

Even now, arthritis causes real disability and life impacts, and women are disproportionately affected. Because the Centers for Disease Control and Prevention (CDC) and state-based arthritis programs strive to prevent limitations, morbidity, mortality, and disabilities among those with arthritis, reviewing the arthritis burden and impact on women compared with men will aid in increasing awareness of the problems associated with arthritis. The purposes of this paper are to document the overall impact of arthritis as a public health problem, characterize the public health burden and impact of arthritis on women, compare it to the burden among men, and review effective but underused evidence-based arthritis self-management programs.

PUBLIC HEALTH BURDEN OF ARTHRITIS

Arthritis and other rheumatic conditions (arthritis) actually include more than 100 diseases and conditions. Most of them are characterized by pain, aching, stiffness, and swelling in and around joints or elsewhere in the musculoskeletal system. The most common type, osteoarthritis (OA), or degenerative joint disease, is typical of most types of arthritis in that it is more common in women. Systemic lupus erythematosus (SLE), fibromyalgia, and rheumatoid arthritis (RA) also affect women disproportionately. Forms of arthritis with systemic manifestations, such as RA and SLE, can damage the heart, lungs, kidneys, liver, and other organs and systems and contribute to premature mortality. High premature mortality in SLE is found particularly among working-age black women.[6]

Prevalence (national, state, age, race/ethnicity)

For public health surveillance purposes, individuals are considered to have arthritis if they answer Yes to the question: Have you ever been told by a doctor or other health professional that you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia? This case-finding question for arthritis is used on national (e.g., National Health Interview Survey [NHIS], Arthritis Conditions Health Effects Survey [ACHES]) and state surveys (e.g., Behavioral Risk Factors Surveillance System [BRFFS]) and to measure arthritis objectives in *Healthy People 2010*, the nation's health objectives.[7–9] Although dependent on self-report of a doctor diagnosis, this single case-finding question appears valid for public health surveillance purposes.[10,11]

In 2006, the CDC combined data from NHIS[12,13] 2003–2005 Sample Adult Core components to estimate average annual arthritis prevalence in the civilian, noninstitutionalized U.S. population aged ≥ 18 years.[2] Overall, 21.6% (46.4 million) of adults reported arthritis, with significantly higher age-adjusted prevalence in women than in men (24.4%, [95% confidence interval (CI) 23.9-24.9] vs. 18.1% [17.6-18.6])(Table 1). Arthritis prevalence increased with age and was higher among women than men in every age group (Fig.1, unpublished CDC data) and among all racial/ethnic groups, including Hispanic subgroups, Asians, and Native Americans, racial/ethnic groups not previously analyzed.[14] Further, state-level BRFSS prevalence estimates by sex found women reporting a higher prevalence of arthritis than men in every jurisdiction (Fig. 2, unpublished CDC data). When examined by stan-

Table 1. Population Prevalence and Impact of Doctor-Diagnosed Arthritis among All Adults and by Gender, United States, National Health Interview Survey[a,b]

	Total		Women		Men	
Prevalence	*Unadjusted % (95% CI) [No. in millions]*	*Age adjusted % (95% CI)*	*Unadjusted % (95% CI) [No. in millions]*	*Age adjusted % (95% CI)*	*Unadjusted % (95% CI) [No. in millions]*	*Age adjusted % (95% CI)*
Doctor-diagnosed arthritis[2]	21.6 (21.2–22.0) [46.4]	21.5 (21.1–21.9)	25.4 (24.8–26.0) [28.3]	24.5 (24.0–24.9)	17.6 (17.1–18.0) [18.1]	18.1 (17.6–18.6)
Impact measures						
Arthritis-attributable activity limitation[2]	8.8 (8.6–9.1) [18.9]	8.8 (8.6–9.1)	10.7 (10.4–11.0) [11.9]	10.3 (10.0–10.6)	6.8 (6.5–7.1) [7.0]	7.0 (6.7–7.3)
Arthritis-attributable work limitation[c,15]	5.3 (5.0–5.7) [6.9]	5.3 (5.0–5.7)	6.3 (5.8–6.9) [4.2]	6.3 (5.8–6.9)	4.3 (3.9–4.9) [2.7]	4.3 (3.9–4.9)
Severe joint pain	5.1 (4.8–5.4) [10.5]	5.1 (4.8–5.4)	6.7 (6.2–7.1) [7.1]	6.5 (6.1–6.9)	3.4 (3.1–3.8) [3.4]	3.5 (3.2–3.9)
Serious psychological distress[16]	1.2 (1.1–1.4) [2.4]	1.2 (1.0–1.3)	1.6 (1.4–1.9) [1.7]	1.6 (1.4–1.8)	0.7 (0.6–0.9) [0.7]	0.7 (0.6–0.9)
Frequent anxiety/depression[16]	5.5 (5.2–5.8) [11.2]	5.5 (5.2–5.8)	7.1 (6.7–7.6) [7.6]	7.0 (6.6–7.5)	3.6 (3.3–4.0) [3.6]	3.7 (3.4–4.1)

[a]2002 National Health Interview Survey (NHIS) data except for Doctor-diagnosed arthritis and Arthritis-attributable activity limitation, which use NHIS 2003–2005; Doctor-diagnosed arthritis defined as 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?; Arthritis-attributable activity limitation: Are you now limited in any way in any of your usual activities because of arthritis or joint symptoms?; Arthritis-attributable work limitation: In this next question, we are referring to work for pay. Do arthritis or joint symptoms now affect whether you work, the type of work you do, or the amount of work you do?; Severe joint pain: During the past 30 days, how bad was your joint pain on average? Please answer on a scale of 0–10, where 0 is no pain or aching and 10 is pain or aching as bad as it can be. Pain levels of 7–10 were considered severe; Serious psychological distress (PSD) is determined using the Kessler 6 scale, with a score of ≥13 used to define SPD[28]; Frequent anxiety/depression: During the past 12 months have you been frequently depressed or anxious?

[b]All estimates are published in cited references or generated by CDC authors.

[c]Only for adults aged 18–64 years old.

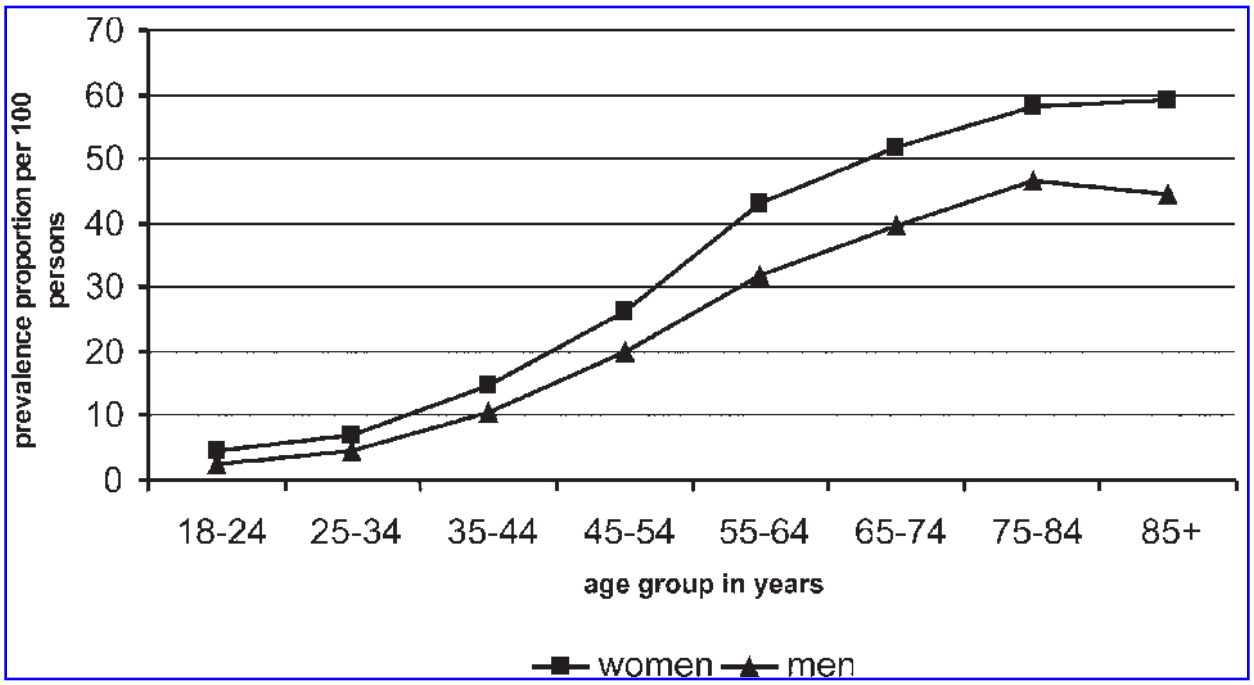

FIG. 1. Gender-specific prevalence of doctor-diagnosed arthritis by age group. National Health Interview Survey, 2003–2005. CDC unpublished data.

dard prevalence cutoff points, women in only one U.S. state (Hawaii) were in the lowest prevalence group, and men in just two states (Missouri and West Virginia) were in the highest group. In the majority of jurisdictions (32), women were in the highest prevalence group.

Arthritis impact on the healthcare system (hospitalizations, ambulatory care visits)

For health services research, the National Arthritis Data Workgroup (NADW) list of diagnostic codes[17] from the *International Classification*

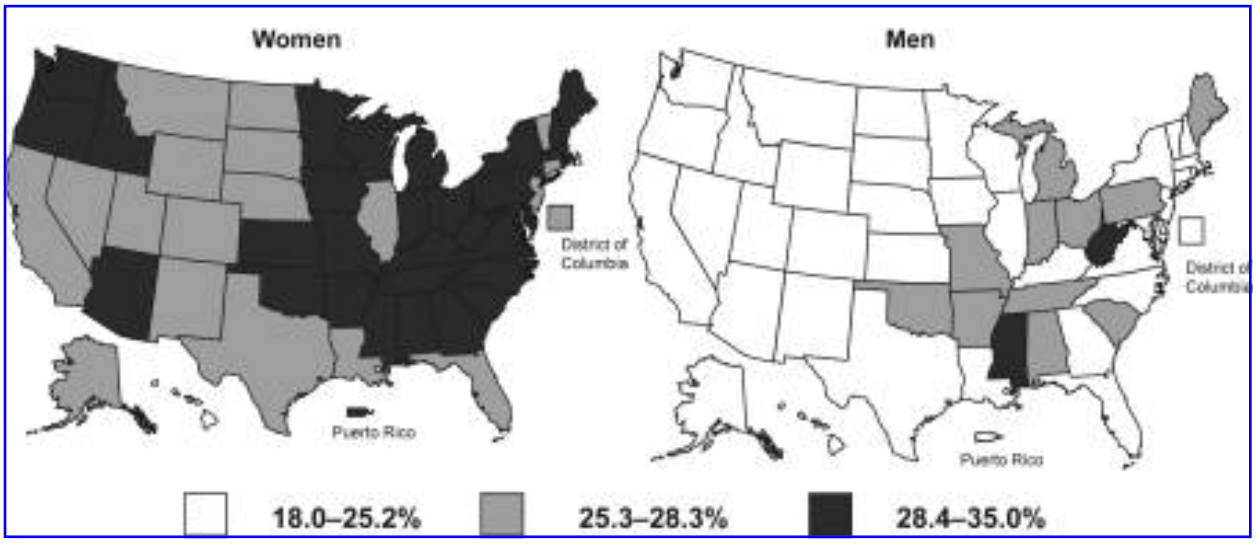

FIG. 2. Age-adjusted population of doctor-diagnosed arthritis by gender in 50 U.S. States, Washington, DC, and Puerto Rico. Behavioral Risk Factor Surveillance System, 2005. CDC unpublished data.

of Disease—Clinical Modification, 9th ed. (ICD-9-CM)[18] is used to define arthritis and other rheumatic conditions in clinically identified samples. Using this definition, three national surveys (National Hospital Discharge Survey [NHDS], National Ambulatory Medical Care Survey [NAMCS], and the National Hospital Ambulatory Medical Care Survey [NHAMCS]), are used to characterize the health system burden of arthritis by generating estimates of hospitalizations and ambulatory medical care use related to arthritis.

Hospitalizations (NHDS)

The CDC estimated that approximately 1 million hospitalizations occurred among all ages in 2003 for which arthritis was the primary diagnosis (Fig. 3, unpublished CDC data); nearly 60% of these were for females. Also in that year, an additional 2.5 million hospitalizations had arthritis as a secondary diagnosis; female patients accounted for 64% of these hospitalizations. Although a secondary diagnosis of arthritis may seem less relevant to disease burden, symptoms and functional limitations of arthritis have the potential to affect patient supervision, therapies, treatment approach, or medications (due to interactions). Furthermore, because arthritis is associated with mobility limitations, pain, and depression, it may complicate both inpatient and posthospitalization medical and self-management efforts for other chronic conditions, such as diabetes and cardiovascular conditions.

Ambulatory care visits (NAMCS, NHAMS)

Analyses of ambulatory medical care (physicians' offices and hospital outpatient and emergency departments) using 2002–2004 NAMCS/NHAMCS data estimated 43 million total visits for which arthritis was the primary diagnosis; women accounted for 64% of this total (Fig. 4, unpublished CDC data). Most of the approximately 27.6 million visits by women occurred in physicians' offices. Women accounted for the majority of ambulatory medical care visits in physicians' offices and hospital outpatient departments; however, men and women appeared to use emergency departments with similar frequency.

Costs

Estimates of national medical expenditures ($81 billion) and earnings losses ($47 billion) attributable to arthritis and other rheumatic conditions (AORC) totaled $128 billion in 2003.[19] Surprisingly, direct average annual per person medical expenditures attributable to AORC were higher for men than for women ($2206 vs. $1454) (Miriam Cisternas and Aimee Foreman, written communication) despite higher disease prevalence in women. Importantly, these cost estimates do not reflect nonpaid work, the bulk of which has traditionally been provided by women. Also, the prevalence of arthritis is proportionately higher among older adults.[20] As the U.S. population ages, a corresponding rise is expected in related economic costs and other impacts.

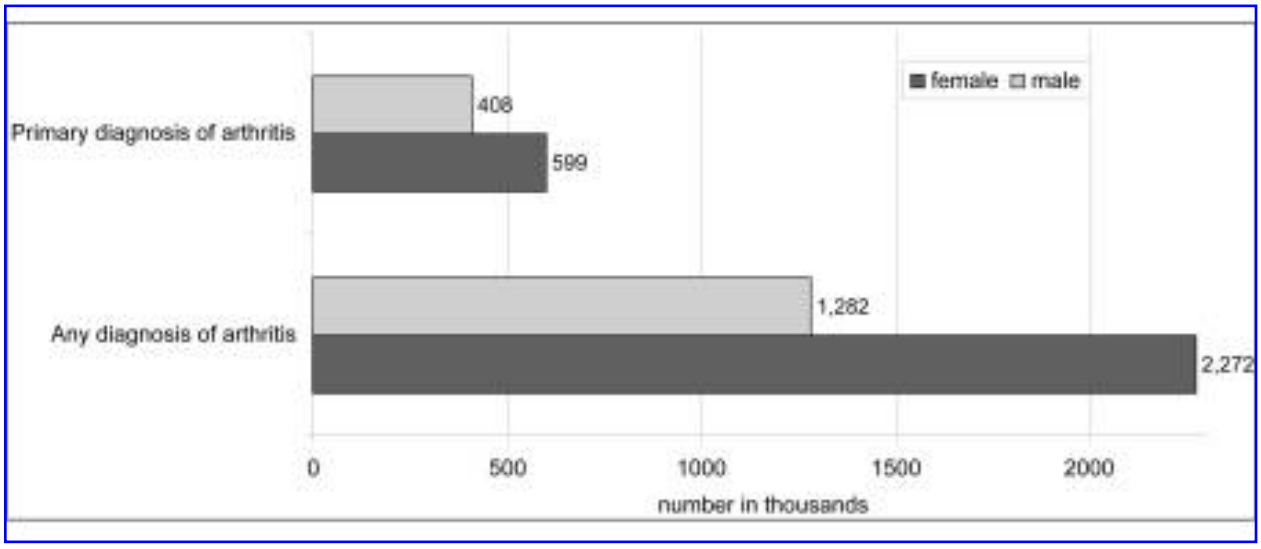

FIG. 3. Arthritis-related hospitalizations, all ages. National Hospital Discharge Survey, 2003. CDC unpublished data. Arthritis defined by the National Arthritis Data Workgroup list of diagnostic codes from the IDC-9-CM, used to identify arthritis and other rheumatic conditions in clinical populations.

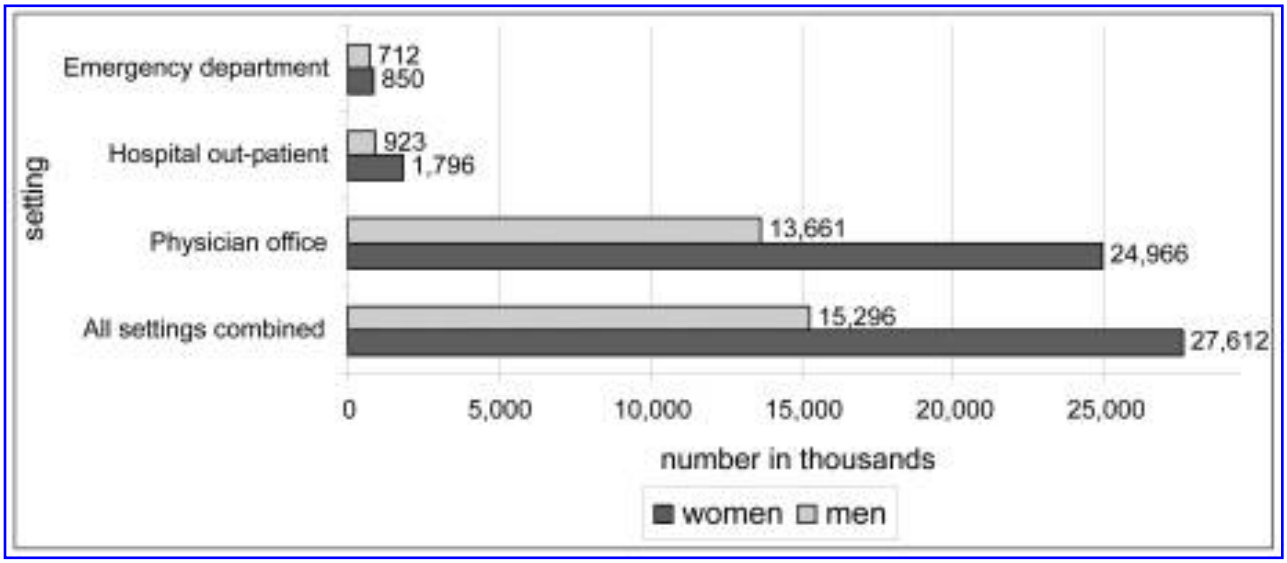

FIG. 4. Ambulatory care visits for primary diagnosis of arthritis by gender, 18+ years. National Ambulatory Medical Care Survey/National Hospital Amulatory Medical Care Survey, 2002–2004. CDC unpublished data. Arthritis defined by the National Arthritis Data Workgroup list of diagnostic codes from the ICD-9-CM, used to identify arthritis and other rheumatic conditions in clinical populations.

LIFE IMPACTS OF ARTHRITIS

Summary disability measures

Arthritis is the most frequent physical cause of disability in both the overall population and among women, 22.4% of whom identify arthritis or rheumatism as the main cause of their disability compared with 11.0% of men.[21] Another disability measure, the disability adjusted life year (DALY), is designed to create more complete estimates by combining nonfatal health outcomes with the more traditional mortality counts.[22] Even when only hip and knee OA are considered and compared with other health conditions, behaviors (e.g., alcohol and drug use), and violence, OA ranks seventh on the leading DALY cause list for U.S. females and twelfth for U.S. males.[23] A third disability measure, years lost to disability (YLD), is a more complex indicator that combines various epidemiological parameters, such as disability incidence, duration, age of onset, and social distribution, combined with other statistical and design techniques to generate internally consistent epidemiological estimates for nonfatal conditions.[22] YLD rankings show arthritis to be a leading cause of disability and also show the prominent and disproportionate toll of arthritis on women, for whom OA (hip and knee) ranks as the second leading cause of YLD behind only unipolar major depression; RA ranks fifteenth. For men, OA is the third leading cause of YLD behind only alcohol use and unipolar major depression; RA is not prevalent enough in men to appear in the top 20.[23]

Arthritis-attributable measures

Physical impacts of arthritis cause limitations in many life roles and activities. More than 10% of all U.S. women >18 years of age report arthritis-attributable activity limitation, whereas the same is true for only 7% of men (Table 1).[2] Among adults with arthritis, 39% of women and 36.6% of men report arthritis-attributable activity limitation (Table 2).[2] Results from a recent report indicate that women, older adults, persons with little education, and those who are overweight, obese, or physically inactive are more affected by arthritis-attributable activity limitations.[2]

For U.S. adults between 18 and 64 years old, the prevalence of arthritis-attributable work limitation (AAWL) was 5.3% (Table 1) in 2002.[15] Women reported a higher prevalence of AAWL than men in both the overall population (6.3% vs. 4.3%)[15] and among adults with arthritis (30.1% vs. 27.5%, unpublished CDC data) (Tables 1 and 2). In ACHES, a national survey fielded during 2005 and 2006, the three components (whether you work, type of work, and amount of work) of the AAWL question were queried separately, and information was also gathered on volunteer work. Future results from this study are expected

Table 2. Proportion of Selected Impact Measures and Characteristics among All Adults with Doctor-Diagnosed Arthritis by Gender, United States, National Health Interview Survey[a,b]

	Total		*Women*		*Men*	
Impact measures	*Unadjusted % (95% CI)*	*Age adjusted % (95% CI)*	*Unadjusted % (95% CI)*	*Age adjusted % (95% CI)*	*Unadjusted % (95% CI)*	*Age adjusted % (95% CI)*
Arthritis-attributable activity limitation[2]	40.9 (40.1–41.7)	38.1 (37.1–39.1)	42.3 (41.4–43.2)	39.0 (37.7–40.2)	38.8 (37.4–40.2)	36.6 (34.8–38.4)
Arthritis-attributable work limitation[15,c]	29.5 (27.7–31.2)	29.0 (27.0–31.1)	30.4 (28.1–32.7)	30.1 (27.5–32.9)	28.2 (25.6–30.9)	27.5 (24.5–30.8)
Severe joint pain[24]	24.6 (23.4–25.9)	24.6 (23.0–26.3)	27.5 (25.9–29.2)	26.8 (24.6–29.1)	20.2 (18.4–22.1)	21.2 (18.8–23.7)
Serious psychological distress[16]	5.6 (5.0–6.3)	6.9 (5.9–8.0)	6.7 (6.2–7.2)	8.4 (7.0–10.0)	4.2 (3.8–4.6)	4.8 (3.7–6.2)
Frequent anxiety/depression[16]	26.2 (24.9–27.5)	28.8 (27.0–30.7)	29.5 (28.7–30.3)	33.0 (30.5–35.5)	21.3 (20.3–22.3)	22.8 (20.3–25.2)
Health behaviors						
Physical inactivity[25]	42.8 (41.3–44.5)	37.0 (35.0–38.7)	45.9 (44.9–46.9)	38.9 (36.6–41.3)	40.0 (38.8–41.2)	33.7 (31.1–36.5)
Obese	34.0 (33.2–34.8)	34.7 (33.6–35.8)	34.1 (33.1–35.2)	34.5 (33.2–35.8)	33.8 (32.5–35.1)	35.0 (33.2–36.8)
Arthritis self-management						
Weight counseling if BMI ≥25.0[26]	40.2 (38.5–41.9)	37.3 (35.0–39.6)	43.7 (41.6–45.9)	41.7 (38.7–44.9)	35.7 (33.1–38.4)	32.0 (28.7–35.5)
Physical activity counseling[26]	55.8 (54.4–57.1)	55.5 (53.7–57.4)	59.2 (57.6–60.8)	59.4 (57.1–61.7)	50.2 (47.9–52.6)	49.5 (46.3–52.7)
Arthritis education[26]	10.7 (9.8–11.6)	10.8 (9.6–12.0)	11.2 (10.2–12.4)	11.3 (9.7–13.0)	9.7 (8.5–11.1)	10.0 (8.3–12.0)

[a]2002 National Health Interview Survey (NHIS) data except for Doctor-diagnosed arthritis and Arthritis-attributable activity limitation, which use NHIS 2003–2005; Doctor-diagnosed arthritis defined as 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?; Arthritis-attributable activity limitation: Are you now limited in any way in any of your usual activities because of arthritis or joint symptoms?; Arthritis-attributable work limitation: In this next question, we are referring to work for pay. Do arthritis or joint symptoms now affect whether you work, the type of work you do, or the amount of work you do?; Severe joint pain: During the past 30 days, how bad was your joint pain on average? Please answer on a scale of 0–10, where 0 is no pain or aching and 10 is pain or aching as bad as it can be. Pain levels of 7–10 were considered severe; Serious psychological distress (PSD) is determined using the Kessler 6 scale, with a score of ≥13 used to define SPD[28]; Frequent anxiety/depression: During the past 12 months have you been frequently depressed or anxious?; Physical inactivity: Those reporting that they never participated in, or were unable to participate in, light, moderate, or vigorous physical activity for at least 10 minutes per occasion were defined as inactive;[25] Obese: body mass index (BMI) ≥ 30.0, calculated as weight in kilograms divided by height in meters squared; Weight counseling: has a doctor or other health professional ever suggested losing weight to help your arthritis or joint symptoms?; Physical activity counseling: Has a doctor or other health professional ever suggested physical activity or exercise to help your arthritis or joint symptoms; Arthritis education: Have you ever taken an educational course or class to teach you how to manage problems related to your arthritis or joint symptoms?

[b]All estimates are published in cited references or generated by CDC authors.

[c]Only for adults aged 18–64 years old.

to provide additional insight regarding the impact of AAWL experienced by different population groups with arthritis, including differences between women and men.[27]

Joint pain

Not surprisingly, nearly a quarter of all adults with arthritis report severe joint pain in the last month (Table 2),[24] which corresponds to >5% of the adult population (unpublished CDC data). Again, women report higher prevalence of this measure of arthritis impact than men (27.5% vs. 20.2%, unpublished CDC data) (Table 1).

Mental and emotional health

Among those with arthritis, the prevalence of frequent anxiety or depression (Yes to During the past 12 months have you been frequently depressed or anxious?) is about 33% in women and closer to 23% in men (Table 2).[16] Another measure, serious psychological distress (SPD), a psychometrically validated, nonspecific measure of mental health,[28] found the same pattern (Table 2); women with arthritis have approximately 40% higher prevalence of SPD than their male counterparts.[16] Research has demonstrated a higher prevalence of depressive symptoms, major depression, and anxiety in persons with arthritis compared with those without,[29] and individuals who have both mental health disorders and arthritis may be at greater risk for increased disability and decreased responsiveness to treatment interventions, coping ability, and poorer quality of life,[16] suggesting that frequent mental health screening and targeted interventions may benefit these populations.

PUBLIC HEALTH APPROACHES TO ARTHRITIS

Healthy People 2010 is the third in a series of 10-year plans detailing health objectives for the United States and the first to include arthritis-specific objectives.[9] The three main public health interventions for arthritis (self-management education, physical activity, and weight management), as well as other arthritis measures, are addressed in eight arthritis-specific and seven arthritis-related objectives. Measuring progress toward *Healthy People 2010* objectives moves arthritis-related public health accomplishments forward on a national level and provides benchmarks for current efforts.

The framework for a public health approach to arthritis is outlined in the *National Arthritis Action Plan: A Public Health Strategy (NAAP)*[30] and is organized around surveillance, epidemiology, prevention research, communication and education, and approaches for programs, policies, and systems. Nearly 90 organizations, including the CDC, the Arthritis Foundation, and the Association of State and Territorial Health Officials, came together to create NAAP and continue to carry out its objectives. Shortly after its release, the CDC received its first congressional appropriation for arthritis.

The work of the CDC Arthritis Program to reduce arthritis burden and impact is founded on the NAAP goals of reducing pain and disability and improving quality of life for those with arthritis and the CDC's own health protection goals to ensure optimal health at every stage of life. The CDC Arthritis Program and its partners work to improve the quality of life for adults with arthritis and to change attitudes and behaviors related to self-management by improving the science base, measuring the burden of arthritis, reaching the public, and building state arthritis programs.

The CDC is committed to improving the public health science base for arthritis and supports research to learn more about arthritis and effective management strategies. NHIS, BRFSS, and other data sources are used to define national-level and state-level arthritis burden, provide prevalence estimates, measure arthritis impact on daily life, and monitor trends. For example, in 2005, CDC reported on progress in arthritis self-management at the national level through weight counseling, physical activity counseling, and arthritis education.[26] Also, data, including cost and prevalence estimates and future projections, are produced for use by policymakers to carry out the policy and systems changes recommended in NAAP.

Another critical role of the CDC's Arthritis Program is reaching the public with appropriate, effective, evidence-based messages and interventions to decrease or delay disability and increase quality of life among those with arthritis. For example, "Physical activity. The arthritis pain reliever" is the theme line of a communications campaign developed by CDC in partnership with state health departments and Arthritis Founda-

tion chapters that aims to (1) increase knowledge of the benefits of physical activity and appropriate physical activity for persons with arthritis, (2) strengthen beliefs about the importance of physical activity for arthritis management, (3) increase confidence of persons with arthritis in their ability to do regular, moderate physical activity, and (4) increase trial attempts of physical activity.[31] The CDC is currently engaged in evaluating a similar communications campaign for Spanish-speaking adults. This campaign, also designed to promote the benefits of physical activity, is called "Buenos Días, Artritis."

State programs are among CDC's most important partners in expanding the reach of evidence-based programs. Thirty-six state programs are funded through CDC's Arthritis Program. The main activity of state-level programs is increasing the availability and reach of evidence-based arthritis self-management programs. Funded states partner with local chapters of the Arthritis Foundation and others to increase public awareness, coordinate activities, and offer evidence-based arthritis self-management programs.

Overlooked and underused: Evidence-based arthritis self-management interventions

The three main public health interventions that can reduce arthritis impact are arthritis self-management education, physical activity, and weight management. Several evidence-based, community-delivered arthritis self-management education programs for adults are currently available (Table 3). Two such programs are the Arthritis Foundation Self-Help Course and the Chronic Disease Self-Management Program. Both of these 6-week classes have been shown to improve self-efficacy, here meaning confidence in one's ability to achieve self-management goals.[32,33] Originally available only in English, both have been developed by Stanford University into Spanish versions based on researched needs of Spanish-speaking communities.[34] Most evaluations of self-management education programs have shown improvements in physical symptoms, such as reducing pain and depression, improving physical function and quality of life, and delaying disability. Benefits sometimes achieved through arthritis self-management education programs include decreasing healthcare system use, such as physician and emergency department visits, and reducing healthcare costs.[32,33,35] American College of Rheumatology (ACR) guidelines stress the importance of patient education, involvement, and self-management in coping with rheumatological disease.[36,37] Unfortunately, participation in such self-management education is low for both men (10%) and women (11%) (Table 2).[26]

Physical activity can decrease arthritis pain and delay disability. Although in the past persons with arthritis were discouraged from exercising,[38] since the mid-1970s, numerous studies[39–41] have shown both strength training[42–47] and aerobic exercise[45,48–51] to be of benefit to arthritis patients, resulting in decreased pain, improved gait and function, and delayed disability. In its practice guidelines, ACR also explicitly identifies exercise programs, as first-line, nonpharmacological treatments for RA and OA patients,[36,37] yet only 59% of women and 50% of men with arthritis have been counseled on physical activity or exercise to improve their symptoms (Table 2).[26] Interestingly, counseled women were less likely to be physically inactive. This finding suggests that more women than men with arthritis may take more action and modify their health behaviors (e.g., increase activity) in response to counseling by a healthcare provider, which agrees with other studies that suggest gender-specific counseling and interventions may be useful.[25,52]

Weight management, specifically losing weight among those who are overweight or obese, has long been recommended by the ACR for overweight patients with hip or knee OA.[36] Findings from 2003 indicated that only 42% of overweight (defined as body mass index $\geq$25.0) women with arthritis and 32% of overweight men had ever been counseled by a doctor or other health professional to lose weight to improve their symptoms (Table 2).[26]

In addition to its efforts to expand use of currently available evidence-based programs, CDC evaluates promising community-based physical activity and other programs for effectiveness and investigates new methods to deliver self-management education programs. Mail-based and Internet-based delivery approaches are being explored to decrease barriers to effective programs, to reach broader audiences, and to maximize program cost-effectiveness.[26,53] Some early data appear promising.[54] Identifying optimal methods to reach more people who could benefit from interventions, helping state arthritis programs reach more people, developing and evaluating cultur-

Table 3. Currently Available Evidence-Based, Community-Delivered Programs for Adults to Manage Arthritis

Program	*Characteristics*	*Benefits*	*More information*
Arthritis Foundation Aquatic Program (AFAP)	Classes conducted by trained instructor Includes joint range of motion, stretching, breathing, and light aerobic activities Meets 2 or 3 times per week for 1 hour	Improve joint range of motion, strength, physical function, and health status Decrease pain	1(800)568-4045 *www.arthritis.org/events/getinvolved/ProgramsServices/aquaticprogram.asp*
Arthritis Foundation Exercise Program (AFEP) (formerly PACE)	Community-based, nonaquatic recreational exercise program taught by trained instructors Includes range of motion and endurance activities, relaxation techniques, and health education Meets 2 or 3 times per week for 1 hour	Increase functional ability, self-efficacy, confidence, self-care, mobility, and activities Decrease depression and pain	1(800)568-4045 *www.arthritis.org/events/getinvolved/ProgramsServices/afep.asp*
Arthritis Foundation Self-Help Program (formerly Arthritis Self-Help Course [ASHC]) or Arthritis Self-Management Program	Guided by 2 trained instructors, at least 1 of whom has arthritis Participants all have arthritis Specifically designed to improve self-efficacy Includes techniques to manage arthritis, identifying appropriate exercise, use of medications, communicating effectively with family, friends, and health professionals, nutrition, developing an action plan, and problem-solving Specific attention to managing pain Spanish version available 6-week course with weekly 2–2.5 hour sessions	Increase quality of life, knowledge, and recommended health behaviors Decrease pain and use of medical services	1(800)568-4045 *www.arthritis.org/events/getinvolved/ProgramsServices/arthritisselfhelp.asp* ***or*** *http://patienteducation.stanford.edu/programs/asmp.html*
Chronic Disease Self-Management Program (CDSMP)	Facilitated by 2 trained leaders, at least 1 of whom has a chronic disease Participants have at least one chronic disease Specifically designed to improve self-efficacy Includes techniques to manage chronic disease, identifying appropriate exercise, use of medications, communicating effectively with family, friends, and health professionals, nutrition, developing an action plan, and problem solving 6-week course with weekly 2–2.5 hour sessions	Improve exercise, communication with physicians, self-reported general health Decrease health distress, fatigue, disability, and social/role activities limitations	Stanford Patient Education Research Center (650) 723-7935 (650) 723-8165 (for information in Spanish) *http://patienteducation.stanford.edu/programs/cdsmp.html*
EnhanceFitness, (formerly Lifetime Fitness Program)	Designed for older adults at varying fitness levels Focuses on exercises for flexibility, low-impact aerobics, strength training, and balance Group classes meet 3 times a week for 1 hour	Improve physical and mental functioning, mental health Increase energy and ability to fulfill role	Project Enhance 206.727.6297 *http://www.projectenhance.org/ind/fitness.html*

ally appropriate programs, better serving diverse groups, and increasing physical activity among persons with arthritis are all research and program goals of the CDC Arthritis Program. As new approaches are developed, disproportionately impacted groups, such as women, merit particular consideration in the tailoring and delivery of programs to lessen the burden of arthritis.

CONCLUSIONS

Arthritis is an ancient disease that remains with us today and continues to exact a large burden on the U.S. population. Gender-disease disparities seem to persist because contemporary women with arthritis report greater prevalence of activity and work limitations, psychological distress, and severe joint pain than their male counterparts (Tables 1 and 2).[16,24] Untreated or inadequately managed arthritis can have a negative impact on people with arthritis by limiting physical function, the ability to engage in valued life activities, to work, to manage other chronic conditions successfully, and much more, making it vital that persons with symptoms seek early diagnosis and treatment. For those with arthritis, quality of life can be improved and pain and disability decreased and delayed through participation in arthritis self-management, appropriate physical activity, and weight management. Unfortunately, opportunities to minimize arthritis impact are being lost despite many safe and effective clinical and public health interventions to manage this disease. Women continue to bear the majority of this burden. Expanding the reach of effective programs to more adults with arthritis, especially women, is expected to help reduce this burden and counter or delay the effects of arthritis.

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