

PHYSICAL ACTIVITY PATTERNS AMONG ADULTS WITH ARTHRITIS AND DIABETES WHO RECEIVE SELF-MANAGEMENT EDUCATION

ABSTRACT

PURPOSE: To examine the physical activity (PA) patterns among adults with arthritis and diabetes who received self-management education. **METHODS:** Sample (n=28,860) included adults (≥ 18 years of age), with arthritis and diabetes who participated in the 2019 Behavioral Risk Factor Surveillance System. Categories of PA were classified as highly active (HACT), moderately active (MACT), low activity (LACT), and inactive (INACT). Multinomial logistic regression analyses adjusted for age, gender, body mass index, race, smoking status, and socioeconomic status were fitted to determine variables that were significantly associated with the outcome (P < 0.05). **RESULTS:** Compared to a referent group of inactive adults, adults with arthritis and diabetes who received self-management education had significantly greater odds of being classified as HACT (odds ratio [OR] 1.7), MACT (OR 2.3), and LACT (OR 1.6) (P < 0.05 for all). **CONCLUSIONS:** Our findings suggest that adults with arthritis and diabetes who receive self-management education engage in greater volumes of PA. Typically, arthritis and diabetes self-management education programs promote physical activity as a mechanism to manage these diseases. More research is needed to determine if a cause-and-effect relationship exists.

INTRODUCTION

The prevalence of arthritis among United States (US) adults with diabetes is approximately 42% (~13 million people). (6) Evidence suggests a beneficial relationship exists between meeting physical activity (PA) recommendations and reduced symptoms associated with diabetes and arthritis. (5) However, there is limited evidence examining the relationship between receiving or not receiving self-management education and level of PA participation. Self-management education for diabetes and arthritis includes training on self-care and optimal PA participation. (8) Increased PA improves whole-body insulin sensitivity and glycemic regulation in adults with diabetes. (3) Often adults with type II diabetes do not meet PA recommendations. However, there is the common misconception that people with diabetes and arthritis should not participate in weight bearing exercise as this may exacerbate degenerative joint symptoms. It has also been reported that regular PA participation is related to reversal of cachexia and improved joint function without a deleterious impact on arthritis-related symptoms. (4) Current PA guidelines for US adults recommend 150 minutes of moderate intensity PA or 75 minutes of vigorous intensity PA per week to maintain a healthy lifestyle. (1)

PURPOSE

Examine the PA patterns among US adults with diabetes and arthritis receiving and not receiving disease self-management education.

METHODS

This study utilizes data from the 2019 Behavioral Risk Factor Surveillance System (BRFSS), a national system of health-based telephone surveys that collect data from all US states regarding resident’s health-related risk behaviors, chronic health conditions, and use of preventive services. The BRFSS is a telephone survey conducted annually by the Center for Disease Control (CDC) in all 50 states, the District of Columbia, and three US territories. (2)

Study Sample

Study sample included U.S. adults over the age of 18 with diabetes and arthritis who received self-management education (N = 10,396) and those who did not receive self-management education (N = 5,258). Data collection and testing procedures were approved by the Research Ethics Review Board of the National Center for Health Statistics. All participants provided informed consent. Use of the 2019 BRFSS data was approved by the Institutional Review Board of UNF.

Diabetes and Arthritis Risk Status

The primary independent variable in this study was status of receiving arthritis or diabetes self-management education. Participants answered “yes” or “no” to the survey question, “Have you ever taken an educational course or class to teach you how to manage problems related to your arthritis or joint symptoms?” and “Have you ever taken a course or class in how to manage your diabetes yourself?” Answering “yes” to either question indicates inclusion in receiving self-management education.

Physical Activity

The dependent variable in this study was PA pattern, which included: “highly active (HACT)”, “moderately active (MACT)”, “insufficiently active (LACT)”, and “inactive (INACT)”. PA pattern is based on self-reported duration, frequency, and activities performed. The estimated PA intensity is reported in metabolic equivalent minutes for comparison with PA recommendations. Meeting the US adult recommendation for PA was reported as MACT (≥ 150 min/week of moderate intensity PA, ≥75 min/week of vigorous intensity PA, or the equivalent combination of both) and HACT (≥300 min/week of moderate intensity PA or ≥150 min/week of vigorous PA). Reporting any PA level under the recommended amount was categorized as LACT and reporting no activity was INACT.

Statistical Analysis

Data in this study was analyzed using SAS 9.4. (7) Following complex variable recoding, descriptive statistics and multinomial regression analyses were conducted. Through complex variable recoding and stratified logistic regression analyses, data was able to be assessed in regard to the association between self-management education status and PA patterns in participants with diabetes and arthritis. Variables provided by the 2019 BRFSS data set were coded into categorical groups. We calculated the prevalence estimates and age-adjusted odds ratios for self-management education among adults with diabetes and arthritis and meeting the 2018 DHHS physical activity guidelines.

RESULTS

Table 1 illustrates the prevalence estimates for receiving self-management education in adults with diabetes and arthritis according to sample characteristics. Among U.S. adult participants (N=10,396) in the 2019 BRFSS, the prevalence of being highly active (HACT) was greater in those 65 years or older for people who received self-management education (31.6%) than those without (24.4%). Participants who were obese were more likely to be inactive whether receiving self-management education (45.7%) or without (60.8%). The prevalence of being non-Hispanic white and inactive was greatest among those receiving self-management education (43.0%) and those without (56.0%).

Table 2 illustrates the results of the multinomial logistic regression analysis examining the associations between self-management education status and meeting PA guidelines. Compared to a referent group of inactive adults, adults with arthritis and diabetes who received self-management education had significantly greater odds of being classified as HACT (odds ratio [OR] 1.7), MACT (OR 2.3), or LACT (OR 1.6) (P < 0.05 for all).

Table 1 Prevalence of Receiving Self-Management Education for Diabetes and Arthritis According to Sample Characteristics: 2019 BRFSS								
Characteristics	Received Self-Management Education (N = 10,396)				Did NOT Receive Self-Management Education (N = 5,258)			
	HACT N (%)	MACT N (%)	LACT N (%)	INACT N (%)	HACT N (%)	MACT N (%)	LACT N (%)	INACT N (%)
Age								
18-44	83 (19.8)	37 (16.7)	66 (23.5)	103 (40.1)	30 (20.4)	14 (8.0)	31 (23.4)	72 (48.2)
45-64	773 (22.3)	444 (12.9)	662 (22.0)	662 (42.8)	322 (16.2)	149 (8.7)	263 (17.2)	869 (57.9)
≥ 65	1820 (31.6)	725 (13.1)	749 (13.1)	2491 (42.1)	741 (24.4)	244 (7.0)	316 (11.3)	1598 (57.3)
Gender								
Male	1264 (32.7)	502 (12.3)	571 (18.0)	1445 (37.0)	587 (23.9)	193 (8.1)	285 (13.8)	1002 (54.2)
Female	1412 (22.4)	704 (14.0)	905 (17.1)	2502 (46.6)	496 (18.3)	214 (7.5)	345 (14.8)	1567 (59.4)
BMI (kg/m ²)								
<18.50 to 24.9	347 (31.7)	137 (13.6)	139 (16.2)	358 (38.5)	149 (28.4)	52 (10.8)	45 (8.5)	294 (52.2)
Not Overweight 25 to <30	864 (36.8)	334 (13.9)	369 (15.7)	901 (33.6)	395 (26.0)	129 (8.6)	166 (15.1)	613 (50.3)
Overweight ≥30	1358 (22.6)	693 (13.3)	895 (18.4)	2423 (45.7)	514 (17.4)	207 (6.9)	367 (14.5)	1489 (60.8)
Race								
nH-White	2017 (28.0)	861 (13.4)	1020 (15.7)	2821 (43.0)	856 (22.8)	306 (7.2)	433 (14.0)	1870 (56.0)
nH-Black	273 (24.4)	177 (14.2)	245 (19.7)	595 (41.7)	97 (16.7)	51 (10.0)	92 (15.5)	349 (57.8)
Hispanic	143 (24.9)	67 (12.9)	86 (21.5)	215 (40.8)	50 (12.7)	15 (6.1)	32 (14.4)	126 (66.8)
nH-Other	185 (28.7)	75 (10.1)	96 (24.4)	275 (36.9)	63 (21.8)	25 (11.5)	43 (14.6)	164 (52.0)
Smoking								
Current Smoker	297 (23.1)	107 (8.9)	178 (19.9)	671 (48.2)	155 (16.1)	55 (7.6)	100 (13.9)	458 (62.5)
Former Smoker	1089 (30.7)	486 (12.5)	519 (15.5)	1471 (41.3)	433 (19.0)	157 (8.7)	212 (15.1)	997 (58.7)
Never Smoked	1282 (25.2)	606 (15.1)	773 (18.5)	1873 (41.2)	503 (24.3)	196 (8.9)	294 (13.9)	1090 (52.9)
Education								
<High School	148 (24.5)	64 (7.0)	103 (16.5)	412 (51.9)	103 (15.1)	25 (2.0)	66 (10.1)	471 (72.8)
High School/GED	676 (22.5)	295 (14.2)	410 (16.9)	1304 (46.3)	326 (17.9)	124 (8.4)	213 (15.5)	1047 (58.2)
Some College/Tech School	897 (27.9)	416 (13.4)	517 (18.3)	1336 (40.4)	331 (25.3)	110 (8.3)	167 (16.3)	638 (50.1)
Graduated College/Tech School	952 (34.3)	430 (16.1)	443 (17.9)	879 (31.8)	330 (29.6)	148 (15.3)	161 (14.5)	389 (40.7)
Income								
<\$15,000	246 (20.8)	134 (11.0)	198 (15.7)	631 (52.5)	126 (23.1)	40 (3.2)	104 (15.9)	427 (57.8)
\$15,000-\$24,999	469 (25.0)	193 (9.1)	289 (19.7)	861 (45.2)	184 (13.7)	60 (4.8)	123 (12.0)	595 (69.4)
\$25,000-\$34,999	271 (23.5)	134 (13.3)	156 (16.5)	413 (46.7)	102 (22.3)	38 (10.0)	44 (16.5)	244 (51.2)
\$35,000-\$49,999	346 (28.7)	171 (15.5)	183 (17.3)	425 (38.5)	135 (27.0)	54 (10.6)	53 (17.6)	244 (44.8)
>\$50,000	933 (31.5)	425 (17.1)	450 (18.8)	852 (32.6)	387 (25.9)	149 (13.6)	170 (15.2)	463 (44.3)

Table 1: Independent variables include age (years), gender, BMI (kg/m²) race, smoking status, education, and income level.

Table 2: Odds ratio and confidence interval (CI) for physical activity level based on response to receiving self-management education in adults with diabetes or arthritis. Physical activity determined by the CDC include levels of highly active (HACT), moderately active (MACT), insufficiently active (LACT), and inactive (INACT).

*Values of (.,7,9) corresponding to "Missing Data", "Don't Know", and "Refused to Respond" were excluded from each variable.

Abbreviations: OR, odds ratio; CI, confidence interval; BMI, Body Mass Index; nH, non-Hispanic

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DISCUSSION

In this large nationally representative sample of U.S. adults, adults reporting a diagnosis of diabetes and arthritis who received disease self-management education from their healthcare provider reported significantly greater odds of being highly active (OR=1.74) and moderately active (OR=2.29). To the knowledge of this research team, this is the first study to suggest that receiving self-management education is associated with greater odds of being physically active than those not receiving the education. Our findings contribute to the evidence suggesting a positive relationship between diabetes and arthritis self-management education programs and meeting the Department of Health and Human Services 2018 Physical Activity Guidelines.

CONCLUSIONS

Receiving self-management education in the treatment of adults with diabetes and arthritis was associated with a 74% increase in the odds of being highly active and a 2.3 times higher odds of being moderately active. Our results should be used to encourage healthcare professionals to increase the provision of self-management education in patients with diabetes and arthritis.

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