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Doctor-Diagnosed Arthritis and Self-Reported Physical Health Function Among Middle-Aged and Older Adults With Serious Mental Illness

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Abstract

Arthritis is one of the most common chronic conditions in aging adults, with both physical and mental health issues and consequences. However, there is insufficient arthritis research among aging adults with serious mental illness (SMI). This study examined rates of doctor-diagnosed arthritis and its cross-sectional associations with self-reported physical health function among adults aged 50 years and older with SMI. Community-based mental health center participants ($n = 176$) reported clinical and sociodemographic data (*e.g.*, physical health function, sex), whereas diagnostic information (*i.e.*, arthritis, psychiatric, and medical diagnoses) was retrieved from medical records. Arthritis prevalence was high (43.8%) and had an independent, negative association with physical health function. Findings suggest that arthritis evaluations and intervention services need to be prioritized in middle-aged and older adults with SMI. Future research should focus on further testing arthritis self-management programs and other nonpharmacological psychosocial approaches for arthritis in aging adults with SMI.

Keywords

Arthritis; serious mental illness; older adults; physical health function

Middle-aged and older adults with serious mental illness (SMI; *e.g.*, schizophrenia spectrum, persistent major depressive disorder, and bipolar disorders) are more likely to have coronary heart disease, cerebrovascular disease, and other incapacitating, life-shortening medical conditions when compared with the general population (Correll et al., 2017). Arthritis, one of the most prevalent and debilitating chronic conditions in the US older adult population (Jafarzadeh and Felson, 2018), commonly occurs with these medical conditions. However, limited research exists on the comorbidity and impact of arthritis among aging adults with SMI.

In the general population, the average US adult first manifests arthritis symptoms by 50 years old, nearly 50% are diagnosed by 65 years, and prevalence rates surge to 70% to 90% at 75 years or older (Barbour et al., 2017). Given that arthritis has interrelated physical health and psychosocial causes, characteristics, and implications (Stone and Baker, 2014), it is common for older adults with arthritis to experience multiple medical and psychiatric comorbidities (Barbour et al., 2017; Murphy et al., 2012). The coexistence of medical and psychiatric conditions often exacerbates one another, leading to functional impairments and early mortality risks (Furner et al., 2011; Hootman et al., 2012). Although there are effective nonpharmacological psychosocial and pharmacological treatments for arthritis available in public healthcare settings (Centers for Disease Control and Prevention, 2011; Hazlewood et al., 2016; Nelson et al., 2014), it is not known if these treatments are efficacious for addressing arthritis-specific outcomes among people with SMI (Druss et al., 2018).

As an initial step, it is important to first understand the scope and severity of arthritis in aging adults with SMI before generalizing current treatments or testing novel arthritis management approaches. The main purpose of this study was to describe the rates of doctor-diagnosed arthritis and associations with self-reported physical health function among a community-based cohort of adults with SMI aged 50 years and older. We also explored whether the association between arthritis and physical health function was independent of sociodemographic characteristics, type of psychiatric diagnosis, and other medical comorbidities. We hypothesized that there would be significant associations between doctor-diagnosed arthritis and self-reported physical health function in aging adults with SMI.

METHODS

Participants

We conducted a secondary analysis of baseline data collected from participants before entering the Helping Older People Experience Success intervention study. One hundred seventy-six participants were recruited from three community-based mental health centers in New England. Inclusion criteria were as follows: 1) aged 50 years or older; 2) diagnosed with SMI; 3) functional impairment; 4) without significant cognitive impairment; 5) no documentation of substance dependence; 6) not diagnosed with a terminal disease; and 7)

not currently residing in a skilled nursing facility or inpatient institution. The intervention study research protocol was approved by the Dartmouth College institutional review board.

Measures

Outcome Variable—Physical health function was self-reported through the reliable, valid 36-Item Short Form Health Survey (SF-36), which measures self-reported physical and mental health (Ware and Sherbourne, 1992). The SF-36 items are rated using Likert-type scales, and then standardized based on a general population sample ($M = 50$, $SD = 10$) and summed into physical health and mental health function subscales. The reliability, validity, and applicability of the SF-36 have also been demonstrated in populations with schizophrenia and other serious mental illness (Tunis et al., 1999).

Predictor and Statistical Covariates—Doctor-diagnosed arthritis, psychiatric diagnosis, and diagnosis of medical comorbidities were retrieved from medical record documentation. Other clinical and sociodemographic information, including age, sex, race, education, and housing status, were collected via self-report through questionnaires.

Data Analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences for Windows, Version 23 (IBM Corp, New York). Descriptive statistics are presented using frequencies, percentages, means, and standard deviations. Group differences by arthritis were analyzed using t -tests, χ^2 tests, or regression analyses. Unstandardized regression coefficients (B) and standard errors of unstandardized regression coefficients ($SE B$) were also calculated using a hierarchical model of multiple linear regression. For the hierarchical models, four different linear regression analyses examined the association between arthritis (1 = yes, 0 = no) and physical health function. For model adjustment, the clinical and sociodemographic characteristics were selected and entered in sequential steps based on previous research (e.g., Sánchez et al., 2016). These statistical covariates included age, sex (1 = female, 0 = male), race (1 = white, 0 = black, Asian, or other), education (1 = completed high school, 0 = did not complete high school education), housing status (1 = independent living, 0 = supervised and supported housing), psychiatric diagnosis (1 = schizophrenia spectrum disorders, 0 = major depressive and bipolar disorders), and medical comorbidities of hypertension (1 = yes, 0 = no), diabetes (1 = yes, 0 = no), chronic obstructive pulmonary disease (COPD; 1 = yes, 0 = no), hypothyroidism (1 = yes, 0 = no), asthma (1 = yes, 0 = no), cardiac disease (1 = yes, 0 = no), and anemia (1 = yes, 0 = no). The first model was unadjusted (model 1); the second model adjusted for age and sex (model 2); the third included model 2 covariates, race, education, and housing status (model 3); and the fourth included model 3 covariates, psychiatric diagnosis, and medical comorbidities (model 4). All statistical tests were two-sided, and p -values less than 0.05 were considered statistically significant.

RESULTS

Our sample consisted of 176 participants, including 77 persons with arthritis (43.8%) and 99 persons without arthritis (56.3%). See Table 1 for the remaining details on the cohort.

As shown in Table 2, arthritis was significantly, negatively associated with physical health function in model 1 ($B = -8.10 \pm 1.68$; $p < 0.001$). In models 2 and 3, arthritis remained negatively associated with physical health function ($B = -6.28 \pm 1.74$, $p < 0.001$; $B = -6.18 \pm 1.78$, $p < 0.001$, respectively). There was also a significant association between arthritis and reduced physical health function among females ($B = -5.15 \pm 1.78$; $p < 0.01$; $B = -5.36 \pm 1.85$; $p < 0.01$, respectively). In the fully adjusted model 4, arthritis remained significantly, negatively associated with physical health function ($B = -4.77 \pm 1.84$; $p = 0.01$). In addition, there was a significant association between arthritis and reduced physical health function in females ($B = -5.94 \pm 1.91$; $p < 0.01$) and among persons with COPD ($B = -3.94 \pm 1.99$; $p < 0.05$). The remaining statistical covariates were not found to be significant in any of the four models.

DISCUSSION

This study shows that nearly half (43.8%) of our community-based cohort of adults aged 50 years and older with SMI had doctor-diagnosed arthritis, which is similar to the rates of 50% for 65 years and older groups from the general population (Barbour et al., 2017). These results suggest that the projections for increased arthritis rates due to the expansive population of aging baby boomers (Hootman and Helmick, 2006) might similarly affect middle-aged and older adults with SMI in the next several decades.

Previous studies indicate that doctor-diagnosed arthritis and SMI diagnosis are each independently associated with poorer physical health in older adults (Furner et al., 2011; Hootman et al., 2012). This study advances beyond other research, because this is the first study to document that doctor-diagnosed arthritis is linked to poorer physical health function among aging adults with SMI. In comparison to study participants without arthritis diagnosis, aging adults with SMI and doctor-diagnosed arthritis were also more likely to report decreased physical health function. This is consistent with findings from other cross-sectional studies on arthritis-related physical limitations among middle-aged and older adults (Abell et al., 2005; Dominick et al., 2004; Havens et al., 2017; Mili et al., 2003). Similarly, adults and older adults with SMI report poorer physical health when compared with the general population (Bressington et al., 2014; Phelan et al., 2001).

Although it has been established that there are higher rates of disabling cardiovascular diseases among people with SMI (Correll et al., 2017), the current results suggest that there is an additional need to address physical health functioning in aging female adults with SMI experiencing either arthritis, COPD, or both conditions. After controlling for clinical and sociodemographic characteristics, psychiatric diagnosis, and other medical comorbidities, the results indicate that the relationship between arthritis and reduced physical health function persisted. However, independent associations were also found between reduced physical health function and female sex as well as COPD diagnosis. Because women experience more nonfatal acute and chronic conditions than men overall (Bird and Rieker, 2008; Courtenay, 2011), female participants then might be prone to poorer physical health function. Other research has also shown that individuals with arthritis and/or COPD have reduced physical functioning when compared with healthy older adults and adults with other chronic conditions (Pitta et al., 2005; Stavem et al., 2000).

Limitations

When interpreting the results from our study, the following limitations should be considered. First, we conducted secondary data analysis and were therefore bound to instrumentation selected and other data collection methods used in the primary study. For instance, neither height, weight, nor obesity status was collected or documented in the dataset. Second, we used a cross-sectional study design that does not allow for causal direction among study variables; thus, our findings do not account for reciprocal or reverse effects between arthritis and physical health function. Furthermore, we did not have access to information on the duration and disease course of the arthritis condition. Third, we used patient-reported instruments, which are important outcomes measures but can be susceptible to bias and lack of insight that may impact the accuracy of responses from individuals who were noninstitutionalized, principally older adults. Therefore, generalizability to the broader population of people with SMI may be limited because individuals with SMI that is more chronic or severe may be institutionalized, and our findings might be more representative of individuals with less functional impairment. In addition, our comparisons to the national arthritis prevalence estimates for older adults might not be accurate because our small cohort of middle-aged and older adults with SMI 50 years and older is different in age range from the available comparison groups of 65+ years.

Suggestions for Further Research

Based on our study's results, there are several suggestions for further research. Because this is one of the initial reports on arthritis rates and related physical health function in aging adults with SMI, future studies should attempt to replicate this line of arthritis inquiry with other large community-based SMI samples. Due to the current opioid and pain mismanagement epidemic, it is critical to investigate the prevalence and physical health impact of arthritis and other chronic pain conditions in understudied, functionally impaired groups such as middle-aged and older adults with SMI. Accumulating cross-sectional cohort data on arthritis is a necessary first step before applying and evaluating the effectiveness of population-based treatments in managing arthritis-related physical health functioning and delaying disease progression among aging adult subpopulations (Brennan and Turrell, 2012), including those with SMI.

In addition, given only the small- to moderate-effect sizes of arthritis self-management programs (Ganji et al., 2018; Kroon et al., 2014), other studies should consider modifying existing nonpharmacological arthritis management approaches before applying population-based methods to high-need, high-risk subgroups such as aging adults with SMI. Future adaptations to integrated self-management intervention content might need to cover psychoeducational materials on frequently cooccurring medical and psychiatric conditions in aging adults with SMI. Moreover, an SMI diagnosis might add other treatment barriers and complicate arthritis-related physical health and psychosocial risks and implications (Bayliss et al., 2003). For instance, age-related decline in health function among older adults with SMI is further exacerbated by SMI-specific deficiencies, such as avolition, functional impairment in self-care and health self-management skills, adverse effects from long-term psychotropic medication use, high health care costs, and inadequate health care (Bartels et al., 2018). New treatment programs, then, might also need to be developed to emphasize

targets and active components of psychotherapeutic or behavioral interventions that are tailored and might be useful for aging adults with SMI.

CONCLUSIONS

Because arthritis is one of the most common, disabling chronic conditions in older adults and is predicted to increase in prevalence with the aging baby boomers, nonpharmacological and pharmacological arthritis management should be a high-priority area for intervention services in healthcare delivery settings. This study shows that doctor-diagnosed arthritis rates among a community-based cohort of adults aged 50 years and older with SMI are similar in prevalence when compared with older age groups from the US population. Arthritis is also independently associated with reduced physical health function in aging adults with SMI. In light of the current study's findings, arthritis should also be prioritized and closely evaluated, managed, and treated among aging adults with SMI. To meet the unique needs of aging adults with SMI, future research in mental health should adapt existing nonpharmacological, psychosocial treatments for arthritis or develop and pilot test novel programs.

DISCLOSURE

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TABLE 1.

Clinical and Sociodemographic Characteristics of the Community-Based Cohort

Variables	Total (<i>n</i> = 176)	No Arthritis Diagnosis (<i>n</i> = 99; 56.3%)	Arthritis Diagnosis (<i>n</i> = 77; 43.8%)	Test Statistic	<i>p</i>
Physical health function, mean score (SD)	46.9 (11.7)	50.4 (11.8)	42.3 (9.9)	$F = 23.28$	0.00
Mental health function, mean score (SD)	40.1 (12.5)	41.2 (12.1)	38.8 (13.1)	$F = 1.54$	0.22
Age, mean years (SD)	60.2 (8.0)	59.8 (7.6)	60.7 (8.6)	$t = -0.74$	0.46
Sex, <i>n</i> (%)				$\chi^2 = 20.08$	0.00
Male	72 (40.9)	55 (31.3)	17 (9.7)		
Female	104 (59.1)	44 (25.0)	60 (34.1)		
Race, <i>n</i> (%)				$F = 0.01$	0.92
White	150 (85.2)	84 (47.7)	66 (37.5)		
Black	19 (10.8)	11 (6.3)	8 (4.5)		
Asian	2 (1.1)	2 (1.1)	—		
Other	5 (2.9)	2 (1.1)	3 (1.7)		
Housing status, <i>n</i> (%)				$\chi^2 = 6.20$	0.01
Independent living	91 (51.7)	43 (24.4)	48 (27.3)		
Supervised/supported housing	82 (46.6)	56 (31.8)	29 (16.5)		
Psychiatric diagnosis, <i>n</i> (%)				$\chi^2 = 11.07$	0.00
Schizophrenia spectrum disorder	98 (55.7)	66 (37.5)	32 (18.2)		
Bipolar or major depressive disorder	78 (44.3)	33 (18.8)	45 (25.6)		
Education, <i>n</i> (%)				$\chi^2 = 2.32$	0.13
High school graduate	129 (73.3)	77 (43.8)	52 (29.5)		
Not high school graduate	47 (26.7)	22 (12.5)	25 (14.2)		
Medical comorbidities, <i>n</i> (%)				$F = 2.03$	0.06
Hypertension	79 (44.9)	42 (23.9)	37 (21.0)		
Diabetes	50 (28.4)	26 (14.8)	24 (13.6)		
COPD	42 (23.9)	20 (11.4)	21 (11.9)		
Hypothyroidism	32 (18.2)	19 (10.8)	13 (7.4)		
Asthma	25 (14.2)	6 (3.4)	19 (10.8)		
Cardiac disease	23 (13.1)	13 (7.4)	10 (5.7)		
Anemia	19 (10.8)	12 (6.8)	7 (4.0)		

TABLE 2.
Linear Regression Models for Arthritis by Physical Health Function Outcome ($n = 176$)

Arthritis	Age	Female Sex	White Race	HS Education	Housing Status	Psych Diagnosis	Hypertension	Diabetes	COPD	Hypothyroidism	Asthma	Cardiac Disease	Anemia
Unstandardized beta coefficients $\pm$ standard errors													
-8.10 $\pm$ 1.68													
-6.28 $\pm$ 1.74	-0.11 $\pm$ 0.10	-5.15 $\pm$ 1.78											
-6.18 $\pm$ 1.78	-0.12 $\pm$ 0.10	-5.36 $\pm$ 1.85	-1.25 $\pm$ 0.96	0.98 $\pm$ 1.87	0.91 $\pm$ 0.56								
-4.77 $\pm$ 1.84	-0.08 $\pm$ 0.11	-5.94 $\pm$ 1.91	-1.38 $\pm$ 0.96	0.50 $\pm$ 1.86	-0.38 $\pm$ 0.60	-1.12 $\pm$ 1.80	-1.89 $\pm$ 1.76	-3.46 $\pm$ 1.96	-3.94 $\pm$ 1.99	-0.57 $\pm$ 2.13	-3.54 $\pm$ 2.43	-2.98 $\pm$ 2.58	1.11 $\pm$ 2.74

All values represented are from multivariable linear regression models (B coefficient $\pm$ standard error). Values in boldface are considered statistically significant.

HS Education indicates completed at least high school education (vs. did not complete high school education); Housing Status, independent living (vs. supervised/supported housing); Psych Diagnosis, diagnosis of schizophrenia spectrum disorder (vs. major depression or bipolar disorder).