



성별에 따른 골관절염 노인의 신체활동 영향요인

황여원^{1,2}, 배은정²

¹동아대학교병원 간호부, ²부산가톨릭대학교 간호대학

Factors Affecting Physical Activity Levels among the Korean Elderly with Osteoarthritis: Focusing on Gender Differences

Yeo-Won Hwang^{1,2}, Eun-Jung Bae²

¹Department of Nursing, Dong-A university Hospital, Busan, Korea

²College of Nursing, Catholic University of Pusan, Busan, Korea

Background: This study was conducted to provide basic data to explore strategies for promoting physical activity differentiated according to the gender of the elderly with osteoarthritis.

Methods: This study was conducted using data from the Korea National Health and Nutrition Examination Survey (2014-2021). Those aged 65 or older and diagnosed with osteoarthritis were included, and a total of 2,915 people were analyzed (male=553 and female=2,362). The level of physical activity was classified according to the World Health Organization guidelines presented by the World Health Organization. Less than 600 metabolic equivalent of tasks (METs)-minutes/week or no physical activity was classified as light-intensity physical activity, and if METs-min/week was 600 or more, it was classified as moderate-to-vigorous physical activity. The data analyzed using Rao-Scott chi-square and multiple logistic regression analysis was calculated according to the Global Physical Activity Questionnaire analysis.

Results: In the elderly male with osteoarthritis, the level of physical activity was low in the case of high age, no spouse, low education level, and poor subjective health condition. In the elderly women, age, residential area, and subjective health status were found to be significant influencing factors.

Conclusions: Differences in influencing factors by gender should be considered in the physical activity improvement intervention program for older adults with osteoarthritis. Furthermore, intervention studies must examine the effects of gender-specific programs on physical activity of older adults with osteoarthritis.

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INTRODUCTION

South Korea is undergoing demographic changes, transitioning into an aged society where older individuals aged

65 years or older constitute 14.3% of the total population. It is anticipated to evolve into a super aged society by 2026.¹⁾ With a mean lifespan of 78.5 years for males and 85.1 years for females in South Korea, population aging is an important social phenomenon.^{2,3)} The growing older population presents numerous challenges that our society must address.³⁾ As life expectancy increases, various health problems become inevitable due to the heightened risk of physical injury and the increased prevalence of chronic diseases such as arthritis, coronary artery disease, hypertension, congestive heart failure, and diabetes.^{3,4)} Meanwhile, the healthy

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■ Corresponding author : Eun-Jung Bae, PhD, RN

College of Nursing, Catholic University of Pusan, 57 Oryundae-ro, Geumjeong-gu, Busan 46252, Korea

Tel: +82-51-510-0735, Fax: +82-51-510-0747

E-mail: ejbae@cup.ac.kr

ORCID: <https://orcid.org/0000-0002-2189-5355>

life expectancy in South Korea is around 10 years shorter than the overall life expectancy.⁵⁾ This discrepancy means that individuals live more than 10 years at the end of their lives without independence, emphasizing the importance of health improving behaviors for disease management and enabling independent daily living.^{2,5)}

Among the chronic diseases affecting older adults, osteoarthritis (OA) is caused by degeneration, and its prevalence is increasing annually due to population aging.⁶⁾ This poses a serious threat to the health-related quality of life in the older population. The disease burden is expected to increase even further as longer life expectancy leads to an extended duration of the disease.^{7,8)} OA causes swelling, aching, heat, and redness, limiting physical activity and daily living due to chronic pain.⁹⁾ This restriction in activities is associated with psychological impairments, including not only depression but also negative self concept and helplessness.⁹⁾ In addition, the increased medical expenses arising from polypharmacy for pain management and recurrent outpatient/inpatient visits can lead to financial burdens, exacerbating psychological impairment.^{10,11)}

The primary objectives of OA treatment included alleviating pain, minimizing disability, and improving and maintaining the motor function of the joint.¹²⁾ Although drug treatment is essential for pain relief, the potential risk associated with medication in the older population must be taken into account depending on the patient's condition. Consequently, suitable non drug treatments running parallel to medications are also necessary.¹³⁾ In particular, for chronic diseases like OA that are difficult to treat, regular physical activity has been reported to be very important for disease management.^{13,14)} As a form of self management for OA, physical activity uses the musculoskeletal system to expend energy and encompasses various forms of physical movement, including activities of daily living, work, and exercise.¹⁵⁾ Regular physical activity not only helps prevent disease progression but also helps to reduce joint pain and improve overall function.^{14,16)}

Levels of physical activity are reported to show significant differences between males and females. In a study comparing physical activity by gender among older individuals with chronic disease, it was found that males consumed 1,000 kcal more energy per week compared to females.¹⁷⁾ Similarly, in a study involving the general older population, males were observed to walk a longer distance

and duration.¹⁸⁾ Moreover, both a physical activity program tailored for the older population and an urban physical activity initiative for health improvement reported higher participation rates for males than for females.^{19,20)} Conversely, more female older individuals were noted to participate in physical activities related to domestic chores.¹⁸⁾ Consequently, gender differences have been reported in the patterns of physical activity among the older population, and this leads to differences in the factors affecting physical activity.²¹⁻²³⁾ Therefore, we hypothesized that there would be gender differences in both the patterns of physical activity and factors affecting physical activity among older patients with OA.

The majority of OA cases in Korea affect the older population, leading to various issues such as economic, physical, and psychiatric challenges. However, most domestic OA research has been conducted on a broader age group spanning from middle age to old age.^{24,25)} Additionally, most research on physical activity has been conducted on the general older population, without considerations for specific diseases.^{1,2,5)} Moreover, there are limited studies addressing gender differences among older individuals with OA. In this study, we used data from the Korea National Health and Nutrition Examination Survey conducted between 2014 and 2021 to ascertain differences in physical activity between older adults (≥ 65 years old) males and females diagnosed with OA. Our objective was to analyze the associated factors. In this way, this study aimed to provide basic data that can be utilized to develop strategies for improving gender differentiated physical activity in older individuals with OA.

METHODS

1. Study design and subjects

This study conducted a secondary analysis of data obtained from the Korea National Health and Nutrition Examination Survey (KNHANES) 2014-2021. The KNHANES is a comprehensive study focusing on the health of the national population and consists of health questionnaires, health examinations, and nutrition surveys. Over the course of 8 years, a total of 61,758 participants were involved in the survey. For this study, we specifically focused on the older population aged ≥ 65 years diagnosed with OA ($n=3,329$). Participants with incomplete responses regarding physical activity were excluded ($n=414$), resulting in the analysis of

the remaining 2,915 participants (553 males and 2,362 females). The KNHANES was approved by the IRB at the Korea Disease Control and Prevention Agency, and informed consent was obtained prior to data collection. We adhered to the prescribed protocols by signing and submitting the 'Requirements for Users of Statistical Data' and 'Security Oath' on the KNHANES homepage (<http://knhanes.cdc.go.kr/>) before accessing the relevant data for the specified years.

2. Measurements

1) Physical activity

The assessment of physical activity adhered to the guidelines for analyzing the Global Physical Activity Questionnaire (GPAQ) presented by the World Health Organization. The intensity and duration of physical activity in the domains of work, leisure, and travel were combined to calculate physical activity as a continuous variable expressed in the metabolic equivalent of tasks (METs)-minutes/week. MET-min is a unit expressing the intensity of physical activity, where 1 MET corresponds to the oxygen required at rest, and the oxygen consumed during various physical activities is expressed as multiples of this value. Specifically, MET-min was calculated for each activity using the following equation: 'MET level×physical activity duration (minutes)×weekly frequency of activity'. Depending on the intensity of physical activity, vigorous activity was assigned a MET level of 8.0 METs, moderate activity 4.0 METs, and travel 4.0 METs. Participants who did not engage in physical activity or had <600 METs-min/week were categorized as the low physical activity (LPA) group, while those with moderate physical activity of 600-3,000 METs-min/week and those with vigorous physical activity of ≥3,000 METs-min/week were collectively categorized as the moderate-to-vigorous physical activity (MVPA) group.

2) Sociodemographic factors

Sociodemographic factors included gender, age, marital status, education, residency, and household income. Age was categorized into bands of 65-69 years, 70-74 years, and ≥75 years, marital status was classified as 'with spouse' or 'alone' (including unmarried, separated, bereaved, and divorced). Education levels were categorized as '≤elementary', 'middle', 'high', or '≥university'. Residency was categorized as 'urban' (dong) or 'rural' (eup/myeon), and household income was

categorized into 'lowest', 'medium', and 'highest' brackets.

3) Health behavioral factors

Health behavioral factors included cigarette smoking, current drinking, and health examinations. Smoking and drinking were dichotomized as either current or non-smoker or drinker, respectively. Health examination was categorized as 'yes' or 'no' depending on whether or not the participant had undergone a health examination in the last 2 years.

4) Mental health factors

Mental health-related characteristics included stress awareness and subjective health status. Stress awareness was categorized as 'low' for participants who reported feeling only a little or almost no stress and as 'high' for those who reported feeling a considerable amount of stress. Subjective health status was categorized as 'poor' for participants who responded with 'poor' or 'very poor' and 'not poor' for those who responded with 'very good', 'good', or 'average'.

5) Health condition factors

Health condition factors included comorbid diseases, obesity, and pain/discomfort. For comorbid diseases, participants were asked if they had been diagnosed by a doctor with hypertension, diabetes, cardiovascular disease, depression, or cancer and were subsequently categorized based on the number of comorbidities (0, 1, or ≥2). Obesity was determined by basal metabolic index (BMI); participants were defined as 'underweight' if they had a BMI of <18.5 kg/m², 'normal weight' for a BMI of 18.5-25 kg/m², or 'obese' for a BMI of ≥25 kg/m². Pain/discomfort was assessed using the Euro quality of life-5 dimensions question, categorizing participants as either 'having a problem' for those who reported significant impairment or some impairment or 'no problem' for participants who reported no impairment.

3. Data analysis

Statistical analysis was conducted using SPSS 26.0 (IBM Corp., Armonk, NY, USA), with a significance level set at $P<0.05$. The KNHANES data used in this study was collected using stratified cluster sampling, and this complex sampling design was duly incorporated into the data analysis. The results were computed with careful consideration of complex sampling factors, including strata, clus-

ters, and weights. In analyzing physical activity among patients with OA, we presented unweighted frequencies and weighted percentages of physical activity based on socio-demographic factors, health behavioral factors, mental health factors, and health condition factors. The relationships between physical activity and each variable were examined using the Rao-Scott chi-square test. We used multiple logistic regression analysis to identify the factors affecting LPA, and statistical significance was assessed using 95% confidence intervals.

RESULTS

1. Participants' characteristics

The characteristics of the participants in this study are shown in Table 1. Among older individuals diagnosed with OA, 2,084 persons (71.5%) were in the LPA group, while 831 persons (28.5%) were in the MVPA group. Compared to the MVPA group, the LPA group exhibited higher percentages of females (83.9%), individuals aged ≥ 75 -year (47.4%), those categorized as “alone” (47.8%), participants with an educational status of “ \leq elementary” (72.5%), residents of “rural” areas (26.8%), and participants with a household income in the ‘lowest’ bracket (52.9%). Regarding health behavioral factors, the LPA group demonstrated higher percentages of current non-smokers (95.4%), current non-drinkers (59.4%), and participants who had not recently undergone a health examination (29.3%). In terms of mental health factors, the LPA group exhibited a higher percentage of participants with high-stress awareness (24.1%) and poor subjective health status (44.5%). Finally, the LPA group showed higher percentages of participants with at least one comorbidity (75.8%), obesity (47.6%), and pain/discomfort (55.7%).

2. Differences in physical activity between male and female older patients with OA

Table 2 illustrates the gender differences in physical activity in this study. Male older participants exhibited significant differences in physical activity based on age ($P=0.006$), marital status ($P=0.001$), education ($P=0.001$), residency ($P=0.012$), subjective health status ($P=0.003$), and pain/discomfort ($P=0.002$). Female older participants demonstrated significant differences in physical activity based on age ($P<0.001$), education

($P=0.002$), residency ($P=0.001$), household income ($P=0.040$), subjective health status ($P<0.001$), number of comorbidities ($P=0.008$), and pain/discomfort ($P=0.004$).

3. Factors affecting LPA in male and female older patients with OA

Table 3 presents the factors influencing LPA in male and female older patients with OA in this study. For male participants, LPA was influenced by age, marital status, education, subjective health status, and the number of comorbidities. Compared to participants aged 65-69 years, those aged 70-74 years and ≥ 75 years were 1.76 and 2.27 times more likely to be in the LPA group, respectively. Compared to participants with a spouse, those who were alone were 2.24 times more likely to be in the LPA group. Compared to participants with an educational level of \geq university, those with middle school or \leq elementary school education were 2.50 and 2.25 times more likely to be in the LPA group, respectively. Lastly, compared to participants with ‘not poor’ subjective health status, those with ‘poor’ subjective health were 1.93 times more likely to be in the LPA group.

For female participants, LPA was significantly influenced by age, residency, subjective health status, and number of comorbidities. In comparison to participants aged 65-69 years, those aged ≥ 75 years were 1.81 times more likely to be in the LPA group. Participants residing in rural areas were 1.44 times more likely to be in the LPA group compared to those living in urban areas. Lastly, participants with “poor” subjective health status were 1.29 times more likely to be in the LPA group than those with ‘not poor’ subjective health status.

DISCUSSION

In this study, we investigated the level of physical activity in male and female older patients with OA and analyzed the related factors with the aim of providing basic data for exploring strategies to improve gender differentiated physical activity.

The proportion of participants in the LPA group was higher among females than males, which is consistent with previous studies reporting lower participation in physical activity among older adult women.^{21,26} The biggest reason why older women do not participate in physical activity is due to safety issues and concerns that they may get injured

Table 1. Participants' characteristics (n=2,915)

Variable	LPA (n=2,084)	MVPA (n=831)
Gender		
Female	1,725 (83.9)	637 (76.2)
Male	359 (16.1)	194 (23.8)
Age, y		
≥75	905 (47.4)	250 (34.2)
70-74	637 (27.2)	267 (29.0)
65-69	542 (25.4)	314 (36.8)
Marital status		
Alone	954 (47.8)	338 (42.1)
With spouse	1,130 (52.2)	493 (57.9)
Education		
≤Elementary	1,516 (72.5)	512 (61.6)
Middle	266 (12.7)	133 (16.0)
High	227 (11.1)	131 (15.8)
≥University	75 (3.7)	55 (6.6)
Residency		
Rural	639(26.8)	178 (18.3)
Urban	1,445(73.2)	653 (81.7)
Household income		
Lowest	1,115 (52.9)	386 (46.4)
Medium	822 (39.8)	360 (43.3)
Highest	147 (7.3)	85 (10.3)
Cigarette smoking		
Smoker	98 (4.6)	34 (4.7)
Non-smoker	1,986 (95.4)	797 (95.3)
Current drinking		
Drinker	837 (40.4)	385 (45.5)
Non-drinker	1,247 (59.6)	446 (54.5)
Health examination		
No	626 (29.3)	212 (26.5)
Yes	1,458 (70.7)	619 (73.5)
Stress awareness		
High	504 (24.1)	173 (20.1)
Low	1,580 (75.9)	658 (79.9)
Subjective health status		
Poor	949 (44.5)	290 (33.3)
Not poor	1,135 (55.5)	541 (66.7)
Presence of comorbid disease		
≥2	686 (32.3)	233 (28.9)
1	898 (43.6)	361 (43.1)
0	500 (24.1)	237 (28.0)
Obesity		
Underweight	24 (1.2)	10 (1.3)
Normal	1,069 (51.2)	443 (52.9)
Obesity	991 (47.6)	378 (45.8)

Table 1. Continued

Variable	LPA (n=2,084)	MVPA (n=831)
Pain/discomfort		
Have problem	1,165 (55.7)	395 (45.2)
No problem	919 (44.3)	436 (54.8)

Values are presented as number (weighted %).

Abbreviations: LPA, light-intensity physical activity, MVPA, moderate-to-vigorous physical activity.

Table 2. Differences in physical activity between male and female older patients with OA (n=2,915)

Variable	Male		χ^2 (P^a)	Female		χ^2 (P^a)
	LPA (n=359)	MVPA (n=194)		LPA (n=1,725)	MVPA (n=637)	
Age, y			13.77 (0.006)			34.84 (<0.001)
≥ 75	163 (44.6)	64 (31.1)		742 (48.0)	186 (35.2)	
70-74	99 (26.1)	56 (25.3)		538 (27.4)	211 (30.2)	
65-69	97 (29.3)	74 (43.6)		445 (24.6)	240 (34.6)	
Marital status			11.11 (0.001)			0.10 (0.789)
Alone	57 (15.4)	16 (5.9)		897 (54.1)	322 (53.3)	
With spouse	302 (84.6)	178 (94.1)		828 (45.9)	315 (46.7)	
Education			22.81 (0.001)			18.52 (0.002)
\leq Elementary	193 (54.0)	81 (39.7)		1,323 (76.1)	431 (67.3)	
Middle	67 (18.4)	30 (13.5)		199 (11.6)	103 (16.1)	
High	70 (18.4)	48 (26.9)		157 (9.7)	83 (13.2)	
\geq University	29 (9.2)	35 (19.9)		46 (2.6)	20 (3.4)	
Residency			7.89 (0.012)			17.42 (0.001)
Rural	124(30.9)	48 (20.0)		515 (26.1)	130 (17.8)	
Urban	235(69.1)	146 (80.0)		1,210 (73.9)	507 (82.2)	
Household income			6.38 (0.095)			9.56 (0.040)
Lowest	174 (47.5)	76 (37.9)		941 (53.9)	310 (48.1)	
Medium	157 (44.4)	92 (49.3)		665 (38.9)	268 (41.6)	
Highest	28 (8.1)	26 (12.8)		119 (7.2)	59 (10.3)	
Current smoking			3.64 (0.122)			0.29 (0.640)
Smoker	59 (17.8)	20 (11.7)		39 (2.1)	14 (2.4)	
Non-smoker	300 (82.2)	174 (88.3)		1,686 (97.9)	623 (97.6)	
Current drinking			0.12 (0.767)			2.52 (0.155)
Drinker	220 (61.5)	130 (63.0)		617 (36.4)	255 (40.0)	
Non-drinker	139 (38.5)	64 (37.0)		1,108 (63.6)	382 (60.0)	
Health examination			0.19 (0.734)			1.21 (0.381)
No	94 (22.9)	40 (21.3)		532 (30.5)	172 (28.2)	
Yes	265 (77.1)	154 (78.7)		1,193 (69.5)	465 (71.8)	
Stress awareness			0.04 (0.863)			3.80 (0.103)
High	56 (14.2)	30 (13.6)		451 (26.0)	143 (22.1)	
Low	306 (85.8)	164 (86.4)		1,274 (74.0)	494 (77.9)	
Subjective health status			12.94 (0.003)			17.66 (<0.001)
Poor	151 (41.4)	50 (26.3)		789 (45.1)	240 (35.5)	
Not poor	208 (58.6)	144 (73.7)		927 (54.9)	397 (64.5)	

Table 2. Continued

Variable	Male		χ^2 (P^a)	Female		χ^2 (P^a)
	LPA (n=359)	MVPA (n=194)		LPA (n=1,725)	MVPA (n=637)	
Presence of comorbid disease			6.40 (0.112)			12.99 (0.008)
≥ 2	123 (32.6)	61 (31.5)		563 (32.2)	172 (28.2)	
1	137 (39.5)	91 (48.9)		761 (44.5)	270 (41.3)	
0	99 (27.9)	42 (19.6)		401 (23.3)	195 (30.5)	
Obesity			0.27 (0.917)			1.11 (0.632)
Underweight	6 (2.1)	4 (2.8)		18 (1.1)	6 (0.8)	
Normal	205 (56.6)	110 (55.3)		864 (50.1)	333 (52.2)	
Obesity	148 (41.3)	80 (41.9)		843 (48.8)	298 (47.0)	
Pain/discomfort			12.79 (0.002)			13.09 (0.004)
Have problem	182 (51.5)	73 (35.9)		983 (56.5)	322 (48.1)	
No problem	177 (48.5)	121 (64.1)		742 (43.5)	315 (51.9)	

Values are presented as number (weighted %).

Abbreviations: LPA, light-intensity physical activity, MVPA, moderate-to-vigorous physical activity; OA, osteoarthritis.

^a P -values by Rao-Scott chi-square test.

while doing physical activities in an inappropriate way.¹⁷⁾ Consequently, there is a recognized need to allocate sufficient time and opportunities for older adult women with chronic diseases to engage in physical activity programs, enabling them to acquire experience and confidence in physical activity. Given the higher prevalence of OA among women than men in Korea, and considering that 81.0% of participants in our study were female, it becomes evident that despite increasing emphasis on chronic disease management for women, their rate of participation in physical activity remains lower than in men. Therefore, it becomes imperative to develop and implement strategies aimed at increasing various forms of physical activity among older adult women with OA.

Older adult men with OA exhibited a lower likelihood of engaging in physical activity when living alone than those with a spouse, aligning with similar findings in other research, where older people living alone demonstrated lower participation rates in physical activity.²¹⁾ This association is attributed to the positive influence of support and encouragement from a cohabiting spouse on physical activity. Additionally, lower education was associated with reduced physical activity among older adult men with OA. This is consistent with previous studies in the older population, where a higher educational level correlated with increased levels and practice rates of physical activity.^{21,22)} Generally, people with higher educational levels possess broader

health-related knowledge and increased awareness of the positive effects of physical activity,²¹⁾ which is believed to contribute to increased participation. Consequently, physical activity programs for older adult men should be tailored differently based on educational status. For the older population with low education status especially, the program needs to be structured in a way that is easy to understand and follow. However, a study by Moon and Lee,²²⁾ revealed that low educational status affected physical activity in older adult women, not men and that low educational status was associated with less physical activity. This demonstrates that further repeated research is needed to elucidate the effects of educational status on physical activity among older adult men and women.

Among older adult women with OA, those living in rural areas demonstrated a lower likelihood of engaging in physical activity than those living in urban areas. This aligns with previous findings in the Korean older population,^{20,21)} although it differs from a specific study of older individuals diagnosed with chronic disease, where older adult women living in rural areas actually exhibited higher levels of physical activity.²²⁾ This discrepancy is likely attributed to variations in participant numbers or regional differences, suggesting the influence of convenience sampling. Notably, residency was the only significant factor affecting physical activity among female participants. This finding may be linked to factors such as the advanced age of the population, lower

Table 3. Factors affecting LPA in male and female older patients with OA (n=2,915)

Variable	Male		Female	
	OR (95% CI)	<i>P</i> ^a	OR (95% CI)	<i>P</i> ^a
Age, y				
≥75	2.27 (1.34-3.85)	0.003	1.81 (1.37-2.38)	<0.001
70-74	1.76 (1.03-3.01)	0.038	1.26 (0.96-1.65)	0.094
65-69	1.00		1.00	
Marital status				
Alone	2.24 (1.15-4.40)	0.019	0.85 (0.68-1.07)	0.162
With spouse	1.00		1.00	
Education				
≤Elementary	2.25 (1.10-4.60)	0.026	1.17 (0.60-2.30)	0.643
Middle	2.50 (1.12-5.59)	0.026	0.88 (0.43-1.77)	0.710
High	1.49 (0.71-3.12)	0.287	0.96 (0.47-1.99)	0.916
≥University	1.00		1.00	
Residency				
Rural	1.45 (0.88-2.41)	0.146	1.44 (1.07-1.93)	0.017
Urban	1.00		1.00	
Household income				
Lowest	1.02 (0.50-2.07)	0.958	1.20 (0.76-1.88)	0.441
Medium	1.18 (0.61-2.28)	0.622	1.23 (0.80-1.90)	0.350
Highest	1.00		1.00	
Current smoking				
Smoker	1.60 (0.86-2.97)	0.134	0.88 (0.46-1.70)	0.709
Non-smoker	1.00		1.00	
Current drinking				
Drinker	1.16 (0.73-1.82)	0.533	0.98 (0.80-1.22)	0.881
Non-drinker	1.00		1.00	
Health examination				
No	0.91 (0.54-1.54)	0.731	1.02 (0.78-1.32)	0.906
Yes	1.00		1.00	
Stress awareness				
High	1.03 (0.54-1.99)	0.925	1.09 (0.83-1.44)	0.520
Low	1.00		1.00	
Subjective health status				
Poor	1.93 (1.15-3.24)	0.013	1.29 (1.01-1.64)	0.042
Not poor	1.00		1.00	
Presence of comorbid disease				
≥2	0.55 (0.29-1.04)	0.066	1.23 (0.92-1.67)	0.169
1	0.50 (0.28-0.89)	0.018	1.24 (0.95-1.61)	0.115
0	1.00		1.00	
Obesity				
Underweight	0.50 (0.14-1.82)	0.294	1.28 (0.47-3.46)	0.627
Normal	0.92 (0.59-1.43)	0.367	0.97 (0.77-1.21)	0.784
Obesity	1.00		1.00	
Pain/discomfort				
Have problem	1.31 (0.85-2.02)	0.217	1.22 (0.96-1.55)	0.104
No problem	1.00		1.00	

Abbreviations: CI, confidence interval; LPA, light-intensity physical activity; OA, osteoarthritis; OR, odds ratio.

^a*P*-values by multiple logistic regression analysis.

education levels, and the lack of financial or health-related resources for older adult women living in rural areas.²⁶⁾ Consequently, it becomes imperative to develop physical activity programs suited for rural areas, aiming to minimize barriers to participation for older adult women. In addition, there is a pressing need for diverse financial and health-related policies that can provide practical assistance to older adult women in rural areas.

In our study, age and subjective health status were identified as the factors significantly affecting physical activity in both males and females. Older age was associated with a higher likelihood of LPA, which was consistent with previous studies.²⁰⁻²²⁾ Older people often require more assistance with performing activities of daily living due to fear of injury and diminished physical confidence.³⁾ In addition, older individuals tend to spend more leisure time in sedentary activities and have fewer opportunities for work related physical activities due to retirement.³⁾ Consequently, it becomes crucial to develop physical activity programs for the older population that are differentiated based on age groups. Furthermore, poorer subjective health status was associated with reduced physical activity. This is similar to findings from previous studies that identified negative perceptions of one's own health status as a significant barrier to regular physical activity.^{20,21,27)} In the older population, negative self perception of health status is closely related to adverse outcomes such as depression, social isolation, and suicide.²⁸⁾ Poor subjective health can cause depression, and depressive moods can lead to negative attitudes toward health, resulting in reduced physical activity.²⁹⁾ This implies that, in order to improve physical activity among older adults with OA, it will be essential to accurately assess individuals' subjective perceptions of their health and psychological condition to develop intervention strategies tailored to subjective health status. Interventions aiming to improve subjective health should also be integrated to enhance physical activity among older adults with osteoarthritis.

Health behavioral factors such as smoking, drinking, and health examinations did not show a significant effect on physical activity in our study. Although smoking and drinking are commonly measured health behavioral variables alongside physical activity, there are limited studies investigating whether these factors influence physical activity. However, one study focusing on older patients diagnosed with chronic diseases reported higher levels of physical ac-

tivity among participants with a history of drinking.²²⁾ In the future, it will be necessary to conduct research to elucidate the relationship between physical activity and smoking and drinking in older patients with OA. Older individuals with pain or weak joints are generally reported to be less inclined to engage in physical activity.⁶⁾ However, in our study, pain and discomfort did not exhibit any effect on physical activity. In future studies, it will be necessary to investigate the relationship of pain with physical activity in patients with OA using more precise pain indices.

This study had some limitations. First, because we utilized pre-existing data from the KNHANES, we were unable to include predictive variables in the analysis that were not part of the original survey items. Second, the cross-sectional nature of the research introduces limitations in precisely interpreting causal relationships. In particular, attention should be paid to the interpretation of relevance as health behaviors may change depending on health conditions. Third, interpretation may be limited because it is difficult to determine the relationship between the severity of the disease and the level of physical activity in the survey. Fourth, physical activity was assessed through an interview survey, and because there were no standardized criteria for defining physical activity, activity levels were differentiated based on previous studies, which might not represent ideal recommendations.

Nevertheless, our study holds value in that it provided a more precise evaluation of physical activity levels in the Korean population using the GPAQ, utilizing representative data for Korean individuals. We used extensive data from 2014, when the KNHANES began surveying different levels of physical activity up to 2021, to determine the physical activity levels among older adult men and women with OA and the factors affecting physical activity. In this way, we were able to provide basic data for establishing strategies to enhance effective physical activity in both males and females.

요 약

연구배경: 인구 고령화로 골관절염 노인 환자가 증가함에 따라 신체적, 심리적, 사회적으로 많은 문제가 발생될 수 있다. 골관절염 환자의 신체활동은 질병 악화를 예방할 뿐만 아니라 관절 통증의 감소 및 기능 향상에도 도움이 된다. 신체활동 수준은 남녀에 따라 유의한 차이가 있고 그 영향요인 또한 다르다. 따라서 본 연구에서는 65세 이상 골관절염

을 진단받은 남녀 노인을 대상으로 성별에 따른 신체활동 차이와 그 영향요인을 알아보고자 하였다.

방법: 본 연구는 2014-2021년 국민건강영양조사 자료를 이용하고 복합표본설계 정보를 활용하여 분석하였다. 연구 대상자는 골관절염을 진단받은 65세 이상 노인 2,915명(남성 553명, 여성 2,362명)이었다. 신체활동의 수준은 세계보건기구에서 제시한 Global Physical Activity Questionnaire 분석 지침에 따라 산정하고 저강도 신체활동과 고강도 신체활동으로 구분하였다. 골관절염 환자의 신체활동 실태는 가중되지 않은 빈도와 가중 백분율로 제시하였고 각 요인과 신체활동과의 관련성은 Rao-Scott 카이제곱 검정을 이용하였다. 신체활동에 영향을 미치는 요인을 파악하기 위하여 다중 로지스틱 회귀분석을 실시하였고 95% 신뢰구간을 이용하여 통계학적 유의성을 검정하였다.

결과: 골관절염을 진단받은 65세 이상 노인에서 남성보다 여성의 저강도 신체활동군의 비율이 높았다. 남성 노인의 저강도 신체활동에 영향을 미치는 요인은 연령, 결혼 상태, 교육 수준, 주관적 건강 상태, 기저 질환 개수였으며 여성 노인에서는 연령, 거주지역, 주관적 건강 상태가 저강도 신체활동에 통계적으로 유의하게 영향을 미치는 것으로 나타났다.

결론: 본 연구를 통해 골관절염 노인의 신체활동에 영향을 미치는 요인이 성별에 따라 차이가 있음을 확인하였다. 따라서 골관절염 노인의 신체활동을 증진시키기 위해서는 성별 특성을 고려하여 더욱 세분화된 중재 프로그램의 개발 및 적용이 필요할 것이다.

중심 단어: 골관절염, 노인, 신체활동, 성별 차이

ORCID

Yeo-Won Hwang <https://orcid.org/0009-0005-1531-3864>

Eun-Jung Bae <https://orcid.org/0000-0002-2189-5355>

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