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Article

Post-Pandemic Comparative Analysis of Quality of Life and Declared Physical Activity in Individuals with and without Osteoarthritis

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Abstract: This study aimed to compare the levels of physical activity and quality of life reported by Chileans with and without osteoarthritis (OA). Educational level and monthly income data were collected from eighty-two participants (62 women and 20 men), of whom 41 had OA. Concerning the medical information of the persons suffering from OA, diseases, and date of diagnosis were indicated. The International Physical Activity Questionnaire-Short Form (IPAQ-SF) and its Elderly version (IPAQ-E) estimated physical activity levels. The Short Form 36 Questionnaire (SF-36) assessed health-related quality of life. The findings indicate that non-OA subjects scored higher on all dimensions of the SF-36, including physical function, physical role, bodily pain, general health, vitality, social function, emotional role, and mental health. Individuals with OA reported better physical function and role, general health, vitality, social function, and mental health when they walked more. However, no associations were found between any physical activity levels and the degree of pain in people with OA. Our findings underscore the critical role of investigating physical activity in OA patients to enhance their quality of life, particularly in light of the increased sedentary behavior observed post-pandemic.

Keywords: physical activity; osteoarthritis; COVID-19; older adults

1. Introduction

According to the World Health Organization (WHO) [1], aging is a stage of human life that gradually loses physical and mental capacities, significantly affecting health. The increase in the number of people over 60 years of age has been drastic in recent times. Therefore, it is unsurprising that studies on degenerative diseases and quality of life in older people have gained popularity in recent years [2–4].

According to Woolf and Pfleger [5], musculoskeletal conditions are the most common cause of pain and physical disability, with osteoarthritis or osteoarthritis (hereafter, OA) being one of the most common diseases among older adults. This pathology is defined as a condition characterized by chronic and degenerative joint pain of the hyaline cartilage and subchondral bone that interferes with people's functionality and quality of life, being more prevalent in women than in men [6].

In Chile, it is estimated that about 9% of people aged 55 years or older are affected by hip OA and 14% by knee OA, while 4.6% suffer from both pathologies [7]. The main problem with OA is that load transmission is ineffective and causes pain [8]. Despite this, treatments to improve OA

symptoms include exercise [9], as it is well known that light to moderate physical activity can help control painful symptoms in people with OA [10]. However, it is documented that a minority of people suffering from knee and hip OA comply with the recommended physical activity guidelines [11]. In this scenario, it is critical to highlight that physical inactivity is a risk factor for the emotional state of older people, affecting their quality of life from different spheres [12], both for people with and without OA.

Specifically, in Chile, it has been shown that lack of physical activity is a health risk factor in older adults, and it has been suggested that increasing movement can improve the quality of life of this age group [13]. It should also be noted that in this country during the year 2020, there was a significant decrease in the number of surgeries for people with OA as a consequence of the collapse of health services due to the COVID-19 pandemic, which could be recovered within 20 to 41 months [14]. In this regard, studying the quality of life and physical activity levels in persons with OA compared with persons without OA in a post-pandemic period is relevant. The importance of this lies in the fact that COVID-19 may become more severe in older adults given the incidence with which OA occurs in people over 55 years of age and because in the most critical periods, it conditioned treatment strategies for complex diseases such as OA [15].

Given that the antecedents mentioned above indicate the importance of physical activity in people's well-being, the present study aims to compare the level of intense, moderate, and walking physical activity and quality of life reported by Chileans aged 55 years or older with OA and without OA in terms of physical role and function, level of body pain, health perception, vitality, social function, emotional state and role, and health status transition. The last dimension is essential, considering that the COVID-19 pandemic may have affected health perception, as people in Chile feel helpless in the face of pandemic threats [16].

The hypothesis for this study is that those who do not suffer from OA report their well-being and quality of life to be higher than those who suffer from this condition since the intensity of pain may affect their emotional and physical state. In this sense, it is also expected that people with OA would report less physical activity, especially vigorous physical activity, than those who are not diagnosed with this disease since it is documented that there are risks of increased pain when there is increased physical activity in people with OA [17]. Therefore, another hypothesis would be that subjects with OA have more problems in their quality of life when they perform more physical activity compared with those who do not have OA.

2. Materials and Methods

2.1. Participants

A non-probabilistic sample of 82 Chileans aged 55-84 years (62.89 ± 6.02) who were making their pension paperwork were contacted through a pension advisor registered with the Superintendence of Pensions in Chile. 50% of participants had OA and 50% did not. 82% of the participants were women ($N=62$), of whom 35 had OA, while the remaining 27 did not. Of the male participants ($N=20$), 14 did not have OA, and six did. 75% of the participants were married, 13% were divorced, 6% were widowed, and 6% were single. Nineteen participants had no higher education, 22 had a technical degree, 35 were professionals, and 8 had graduate studies. Monthly income ranged from 132 USD to 9300 USD (2360 ± 2055.89).

Participants met the following inclusion criteria: a) be over 54 and b) reside in Chile. For the sample of people with OA, they had to be diagnosed with lateral or bilateral osteoarthritis of the knee or hip in any degree of severity, whether or not they were undergoing treatment. This information was verified based on data from the pension advisor of the participants, who had previously submitted medical records, including a report and disease examinations, to the Pension Fund Administrator (AFP). Those persons who had a disease that implied deterioration of mental capacity, specifically dementia, were excluded. The original sample comprised 86 subjects; however, the two subjects suffering from OA were not considered, so there would not be a significant age difference between the two groups.

2.2. Instruments

Information sheet on the clinical and sociodemographic background of the pension counselor's clients in which data such as sex, age, educational level, and monthly income were found. Concerning the medical information of the persons suffering from OA, the name of the disease and date of diagnosis were indicated.

The International Physical Activity Questionnaire-Short Form (IPAQ-SF) [18] is a self-administered instrument that calculates the physical activity performed by a subject in the last week whose age range is from 18 to 69 years. There is an Elderly version for people over 65 (IPAQ-E). The IPAQ-SF was used for people between 55 and 69 years of age and the IPAQ-E for people over 69. Both instruments have a Spanish version [19,20]. The activities recorded correspond to vigorous, moderate, and walking time. The calculation consists of obtaining the metabolic equivalent of task (Mets), which is obtained by multiplying the daily minutes by the days per week that each intense, moderate, and walking physical activity was performed. The above values are multiplied by 3.3 in the case of walking, 4 for moderate activities, and 8 for vigorous activities. The higher the score, the higher the level of physical activity. Previously, the IPAQ-SF was a reliable instrument with a Cronbach's alpha = 0.703 in a Chilean sample [21]. In this study, Cronbach's alpha was 0.524.

The Short Form 36 Self-Administered Questionnaire (SF-36) [22] is an instrument that measures health-related quality of life, consisting of 36 questions that are divided into the following dimensions: physical function (10 items), which assesses limitations in carrying out routine moderate and intense physical activity; physical role (4 items), which measures problems in daily activities resulting from physical health; bodily pain (2 items) referring to its intensity and how it affects usual activities; general health (5 items), which measures the perception of one's current health, future prospects and resistance to not getting sick; vitality (4 items), which assesses the feeling of energy in the face of fatigue; social function (2 items), which assesses the feeling of energy in the face of fatigue; social function (2 items), which refers to problems and difficulties in relating to other people due to physical or emotional problems; emotional role (3 items), which indicates whether the person has problems in his or her activities due to emotional problems; mental health (5 items), which includes problems of anxiety, depression and interference in general well-being; and health transition (1 item), which compares current health with that of 1 year ago. Each dimension is assessed on a Likert scale with values from 0 to 100. The higher the score, the better the perceived state of health. The Spanish version was used in this study [23]. The SF-36 has been used in Chile and is considered a reliable instrument with a Cronbach's alpha of 0.86 [24]. Cronbach's alpha in this sample was 0.934.

2.3. Data Analysis

A T Student analysis compared the variances between the means of IPAQ-SF, IPAQ-E, and SF-36 scores of OA and non-OA sufferers. Effect sizes were calculated using Cohen's d correlations to complement the statistical analysis. Subsequently, IPAQ-SF, IPAQ-E, and SF-36 scores were calculated by bivariate analysis with Pearson correlation to verify if there is an association between physical activity levels and quality of life controlling for the variable of presence of pathology (with or without OA) to compare the groups.

3. Results

Table 1 shows the relationship between the dimensions of quality of life and level of physical activity for both the OA and non-OA groups. The findings show that non-OA sufferers have higher scores on the dimensions of physical function ($t(73.68) = -9.61$; $p < .001$; $d = 2.10$), physical role ($t(60.65) = -5.45$; $p < .001$; $d = 1.19$), bodily pain ($t(69.64) = 6.68$; $p < .001$; $d = 1.46$), general health ($t(72.20) = -3.06$; $p = .002$; $d = 0.67$), vitality ($t(82) = 2.51$; $p = .007$; $d = 0.55$), social function ($t(68.55) = 2.99$; $p = .002$; $d = 0.65$), emotional role ($t(73.57) = 1.84$; $p = .035$; $d = 0.40$) and mental health ($t(82) = 2.64$; $p = .005$; $d = 0.58$). According to Sawilowsky [25], the effect of having OA on the emotional role is considered small. In contrast, the effect on general health, vitality, social function, and mental health

is considered medium. In turn, the effect is considered large in physical role, very large in bodily pain, and enormous in physical function (see Table 1).

Table 1. 1. Descriptive summary of IPAQ-SF, IPAQ-E, and SF-36 scores by presence or absence of OA.

	With OA M±SD (Min-Max)	Without OA M±SD (Min-Max)	Statistical test (Effect size)
Physical activity level			
Vigorous	677.14± 1889.81 (0–11520)	646.67± 1393.33 (0–8640)	t=−.084 d=0.02
	677.14± 1889.81 (0–11520)	646.67± 1393.33 (0–8640)	t=−.084 d=0.02
Moderate	316.69 ± 845.44 (0–4800)	502.38± 1015.94 (0–5040)	t= .913 d=0.20
	1018.68± 2021.54 (0–11088)	789.25± 1075.71 (0–4158)	t=−.649 d=0.14
Walking	316.69 ± 845.44 (0–4800)	502.38± 1015.94 (0–5040)	t= .913 d=0.20
	1018.68± 2021.54 (0–11088)	789.25± 1075.71 (0–4158)	t=−.649 d=0.14
Health-related quality of life			
Physical Function	40.24± 24.82 (0–90)	85.24± 17.49 (30–100)	t=−.9.605*** d=2.10
	47.62± 46.13 (0–100)	91.07± 23.31 (0–100)	t=−.5.448*** d=1.19
Physical role	45.76 ± 26.19 (0–100)	77.79± 16.71 (41–100)	t=−.6.680*** d=1.46
	57.91± 20.24 (27–100)	69.48± 13.75 (42–97)	t=−.3.064** d=0.67
Bodily pain	56.55± 20.02 (10–100)	66.79± 17.24 (30–100)	t=−.2.512** d=0.55
	69.05± 30.65 (0–100)	85.71± 19.04 (37.5–100)	t=−.2.994** d=0.65
General health	69.84± 43.44 (0–100)	84.92± 30.54 (0–100)	t=−.1.841* d=0.40
	66.76± 20.99 (16–100)	77.43± 15.63 (44–100)	t=−.2.642** d=0.58
Vitality	3.24± 1.10 (1–5)	2.98± 0.75 (1–4)	t=−1.276 d=0.28
	40.24± 24.82 (0–90)	85.24± 17.49 (30–100)	t=−.9.605*** d=2.10
Social function	47.62± 46.13 (0–100)	91.07± 23.31 (0–100)	t=−.5.448*** d=1.19
	45.76 ± 26.19 (0–100)	77.79± 16.71 (41–100)	t=−.6.680*** d=1.46
Emotional role	57.91± 20.24 (27–100)	69.48± 13.75 (42–97)	t=−.3.064** d=0.67
	56.55± 20.02 (10–100)	66.79± 17.24 (30–100)	t=−.2.512** d=0.55
Mental health	69.05± 30.65 (0–100)	85.71± 19.04 (37.5–100)	t=−.2.994** d=0.65
	69.84± 43.44	84.92± 30.54	t=−.1.841*

	(0-100)	(0-100)	d=0.40
	66.76± 20.99	77.43± 15.63	t=-.2.642**
	(16-100)	(44-100)	d=0.58
Health transition	3.24± 1.10	2.98± 0.75	t=-1.276
	(1-5)	(1-4)	d=0.28

¹ Notes *p < .05 **p < .01 ***p < .01.

Table 2 shows the results regarding the association between physical activity and the participants’ quality of life. A significant relationship was found only in the group of people suffering from OA. Specifically, people diagnosed with this condition reported better physical function and role, general health, vitality, social function, and mental health when they walked more. No associations were found between any of the physical activity levels and the degree of pain in people with OA.

Table 2. Pearson correlation between physical activity level scores and SF-36 scores.

Physical Activity Levels in Individuals with OA						
	Vigorous		Moderate		Walking	
	r	(p)	r	(p)	r	(p)
Physical Function	.194	.218	.300	.154	.456	.002**
Physical role	-.036	.819	.050	.754	.305	.049*
Bodily pain	.121	.445	.082	.607	.188	.233
General Health	.032	.842	.286	.066	.485	.001**
Vitality	.102	.522	.299	.055	.358	.020*
Social Function	-.011	.947	.303	.051	.385	.012*
Emotional Role	.091	.567	.268	.086	.298	.056
Mental Health	-.016	.922	.291	.062	.305	.050*
Health Transition	-.129	.415	-.206	.191	-.170	.282
Physical Activity Levels in Individuals without OA						
	Vigorous		Moderate		Walking	
	r	(p)	r	(p)	r	(p)
Physical Function	.192	.224	.105	.509	.043	.785
Physical role	.107	.500	.156	.322	.111	.484
Bodily pain	.264	.091	.124	.434	-.173	.273
General Health	-.029	.856	.164	.301	.094	.556
Vitality	.292	.060	.263	.092	.158	.318
Social Function	.121	.444	.152	.337	.015	.924
Emotional Role	.134	.398	.194	.219	.180	.254
Mental Health	.186	.239	.204	.195	.216	.169
Health Transition	-.090	.572	-.172	.277	-.204	.194

² Notes *p < .05 **p < .01.

4. Discussion

As mentioned in the introduction, the discomfort experienced by people with OA leads to consider the importance of comparing the perception of quality of life and physical activity levels between people with and without OA, which was the objective of this study.

The first hypothesis was that those without OA would report a higher quality of life than those without OA. The results align with the hypothesis as they revealed that people with OA had lower scores on different aspects of their quality of life than those without OA. In addition, evidence has shown that OA leads to a chain of situations that generate, in the first place, the reduction of forced and voluntary movement, which produces a decrease in physical and emotional functions, that is, capacities that maintain the state of health and well-being of people [26,27]. This finding is interesting, considering that in Chile, it has been analyzed that older people need active social participation to improve their well-being, and it has been found that the quality of life is more affected in people suffering from OA [28].

One of the main factors affecting the quality of life of people with OA is pain, which was also an indicator shown to be significantly higher in people with OA than in those without OA. Pain is one of the main movement limitations in people with OA due to increased repetitive joint loading in these joints that already have deteriorated cartilage or, in the most severe cases, not cartilaginous tissue [29]. Therefore, there is a risk of loss of independence and experiencing functional limitations [30], triggering physical and mental health problems [31]. This research hypothesized that people with OA would report less physical activity than those without OA. Interestingly, no significant difference in physical activity levels was found between the two groups.

It is well known that the COVID-19 pandemic restrictions resulted in a worldwide decrease in physical activity [32], which led both healthy people and those with pathologies to reduce movement. The same consequences of pandemia could explain why people with and without OA did not differ in their perception of changes in health transition from one year to the next. In fact, in the Chilean context, the feeling of vulnerability resulting from the pandemic was heightened [33], which could have affected the security of physical and emotional well-being in healthy individuals. However, it should be noted that the severity level may also influence physical activity and perception of health in people with OA [34,35]. However, this variable was not evaluated, so it would be essential to analyze these variables in future studies.

Although this research did not analyze the degree of severity or the time of diagnosis of people with OA, the results showed that people with OA had better physical function and role, general health, vitality, social function, and mental health when they walked more. This is consistent with the fact that those who achieve more significant physical activity, in this case, in a simple mode of movement, can substantially change the musculoskeletal system and other endurance-related capabilities [36]. The development of a more significant amount of strength, even at minimal levels, could reduce pain sensation, mainly due to a twofold situation. That is, periarticular protection is achieved by a greater amount of muscle mass and decreased stiffness by movement, as well as, in many cases, a reduction in body weight due to increased daily physical activity [37]. In addition, walking longer distances without the limitation of pain or fatigue results in better emotional well-being, translated into a desire to maintain physical activity and return to social situations. Even though walking is excellent support for improving cardiovascular and muscular resistance, the load's intensity component seems insufficient to achieve any effect at the level of pain sensation [38,39]. This could have occurred due to the lack of specificity of exercises focused on the periarticular musculature of the knee and hip, which protects those joints by improving proprioception and support of loads thanks to the increase of muscular mass. Consequently, a lower muscle mass prevents the joint from adequately supporting the repetitive axial loads typical of walking [40,41]. In addition, the time of adaptation to physical exercise was not defined and would have a good percentage of explanation for the increase in pain or referral to home.

Although walking was a relevant factor in quality of life only for people with OA, it is an interesting finding, as it contributes to previous literature that has found that walking improves functionality and performance in people with OA [42]. It is essential to guide people with OA in the performance of exercises since it has been recommended that walking exercises in people with OA be in different episodes and not continuous since if the walks are prolonged, it could generate a joint load that increases pain [43]. Therefore, it is necessary to consider the needs and characteristics of subjects with OA, as walking is a factor that could contribute to their quality of life. Another reason why this result is significant is that there is a controversy regarding the association between the degree of pain in people with OA and physical activity, finding in some cases that intense physical activity generates more pain [17]. In contrast, in others, it is pointed out that exercise is a protective factor for pain [44]. Therefore, considering that the walking performed by the subjects is related to a perception of less pain, it is essential to analyze in future research what exercises specifically cause pain and which could contribute to pain in subjects with OA.

5. Conclusions

The results show that osteoarthritis (OA) negatively affects quality of life regarding physical function, bodily pain, general health, vitality, social function, emotional role, and mental health. The effect is substantial on physical function and bodily pain. However, it was also found that in the group of people with OA, more walking is associated with better physical function, physical role, general health, vitality, social function, and mental health. However, no associations were found between physical activity and degree of pain in people with OA.

Importantly, these results highlight the importance of encouraging physical activity in people with OA to improve their quality of life in terms of physical role, general health, vitality, social role, and mental health. In addition, healthcare professionals should keep in mind that bodily pain is a major concern for people with OA, so they should explore other forms of treatment to control pain and improve overall quality of life, especially after the pandemic, where there has been an increase in sedentary behavior in people.

Overall, these results invite us to reflect on the importance of approaching OA comprehensively, not only focusing on pain but also on how it affects people's daily lives and how we can help them stay active and socially engaged in improving their quality of life.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data supporting this study can be requested from the corresponding author. The data are not publicly accessible because they contain sensitive information. An anonymized version of the database, including the relevant variables for reproducing the analyses, has been created and is available upon request.

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