

Sociodemographic data, physical activity and pain intensity in patients with knee osteoarthritis

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Abstract. *Aim.* The purpose of the study was to assess the association between sociodemographic data, physical activity level and pain intensity in patients with knee osteoarthritis. *Material and Method.* One hundred patients (84females, 16males) with symptomatic knee osteoarthritis from selected hospitals in South Western States of Nigeria participated in the study. A structured questionnaire was used to assess the demographic data of the patients. Visual analogue scale and International Physical Activity Questionnaire (IPAQ) were also used to assess the pain intensity and physical activity level of the patients respectively. Data collected was analyzed using descriptive and inferential statistics. *Result.* Results show that 50% male and 61.9% female had moderate physical activity. There was significant association between gender and physical activity ($p<0.05$) and there was significant association between occupation and physical activity ($p<0.05$). In addition, there was significant association between occupation and pain intensity ($p<0.001$) but physical activity has no association with pain intensity. *Conclusion.* It could be concluded from the study that gender affects the physical activity level of the knee osteoarthritis patient and nature of job is associated with pain intensity but physical activity level does not affect pain intensity.

Key Words: *occupation, pain intensity, gender, knee osteoarthritis.*

Introduction

Osteoarthritis is a leading cause of pain in the knee which also affects functioning. Pain in the knee leads to physical disability and reduced quality of life (1).

Knee osteoarthritis is more common in the western world among people over 50 years and it is mostly seen in women (2). It is responsible for greater than 10 million physical visits to doctors and is a common condition which represents a major contribution to the burden of physical disability (3,4). Akinpelu et al., (5) reported that one out of every five adult aged 40 years and above in the Nigerian rural community reported symptomatic knee osteoarthritis. It is a common condition seen in the physiotherapy facilities in Lagos and Ibadan, accounting for 9% of new patients (6). Regular physical activity can reduce the risk of developing type 2 diabetes and metabolic syndrome which are risk factors for osteoarthritis. Research shows that lower rates of these conditions are seen with 120 to 150 minutes (2 hours to 2 hours and 30 minutes) a week of at least moderate-intensity

aerobic activity and the more physical activity someone does, the lower the risk will be (7).

According to the Department of Health and Human Services "2008 Physical Activity Guidelines for Americans," physical activity generally refers to bodily movement that enhances health. Physical activity is any body movement that works your muscles and uses more energy than you use when you're resting. Walking, running, dancing, swimming, yoga, and gardening are examples of physical activity (8).

Physical activity improves health and well-being. It reduces stress, strengthens the heart and lungs, increases energy levels, helps maintain and achieve a healthy body weight and it improves one's outlook on life (9).

Regular physical activity is recommended for overall better health. The more active you are, the more you will benefit (8). To reduce impairments that limit patients' physical functioning, physical therapy treatment can consist of exercise therapy and patient education on the importance of being physically active.

A study has demonstrated beneficial short-term effects of exercise therapy on pain, physical function, and patient self-perceived effect (10). Despite the well-known health benefits of physical activity, more than 50% of men and women 65 years of age or older are sedentary (11). However, the positive post treatment effects of exercise therapy seem to decline over time and gradually disappear in the long term (12). Pisters et al (13), recently demonstrated that the integration of operant behavioral graded activity principles and booster sessions in exercise therapy results in better exercise adherence and a more physically active lifestyle, both within and after the treatment period. Pisters et al (13) also looked at the functional performance in 2589 adults with knee OA and found that there was a consistent relationship between physical activity level and better performance in these patients: Patients with high self-reported physical activity and a timed 20 meter walk test had better performance than patients who were not active, even a small increase in activity was related to better walking function. Better adherence to recommended home exercises as well as being more physically active improves the long-term effectiveness of exercise therapy in patients with OA of the hip and/or knee, (13). The purpose of this study was to investigate the level of physical activity, in association to pain intensity in knee osteoarthritis patients,

Material and Method

This consisted of patients diagnosed with knee osteoarthritis that were attending out-patient clinics at Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), Ile-Ife, University College Hospital (UCH), Ibadan and Adeoyo State Hospital, Ibadan. They were referred from orthopaedic clinic of the aforementioned hospitals with diagnosis of knee osteoarthritis in any of the knee joint. A cross sectional survey research design was used for the study. 140 patients with knee osteoarthritis were recruited for the study using purposive sampling technique, 106 volunteered to participate but 100 questionnaires were available for analysis. The approval of the Ethics and Research Committee of Institute of Public Health, Obafemi Awolowo University, Ile-Ife was obtained. Each participant was approached individually, the aim and purpose of the study was explained. Every volunteered participant was given a copy of the questionnaire and informed consent form to fill.

Visual analogue scale was used to assess the pain intensity of participants and International Physical Activity Questionnaire (IPAQ) was used to assess the physical activity of participants. IPAQ is an instrument that is designed primarily for population surveillance of physical activity among adult (14). IPAQ assessed physical activity undertaken across a comprehensive set of domains including, leisure time physical activity, domestic and gardening (yard) activities, work-related physical activity and transport-related physical activity. The IPAQ short form asked about three specific types of activity undertaken in the four domains.

The specific type of activities that were assessed are; walking, moderate-intensity activities and vigorous-intensity activities. The questionnaire consisted of two sections closed and open ended questions. Section A: obtained demographic data of respondent. It consisted of 4 questions seeking demographic information such as: sex, occupation, age and marital status. Section B: this consisted of 10 questions; it assessed the levels or intensity of physical activity in the last 7 days. Three questions (questions 1, 2 and 3) were seeking information about hard physical activity. Three questions (questions 4, 5 and 6) were seeking information about moderate physical effort. Three questions (questions 7, 8 and 9) seeking information about recreation and leisure activity. One question (question 10) sought activity in sitting. Computation of the total score for the short form required summation of the duration (in minutes) and frequency (days) of walking, moderate-intensity and vigorous-intensity activities. There were three levels of physical activity proposed to classify populations: low, moderate, high. Category 1 – low; this is the lowest level of physical activity. Those individuals who do not meet criteria for Categories 2 or 3 are considered to have a “low” physical activity level. Category 2 - Moderate: The pattern of activity to be classified as “moderate” is either of the following criteria: 3 or more days of vigorous-intensity activity of at least 20 minutes per day; 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day; 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum total physical activity of at least 600MET-minutes/week. Individuals meeting at least one of the above criteria were defined as accumulating a minimum level of activity and therefore classified

as “moderate”. Category 3 - high: a separate category labeled “high” was computed to describe to have higher levels of participation. The two criteria for classification as “high” are: vigorous-intensity activity of at least 3 days achieving a minimum total physical activity of at least 1500 MET-minutes/week, 7 or more days of any combination of walking, moderate-intensity, or vigorous-intensity activities achieving a minimum total physical activity of at least 3000 MET-minutes/week.

Data Analysis. Data was analyzed using descriptive statistics and inferential statistics of Chi-square test of association was used to test the association between pain intensity and physical activity, and between demographic data and physical activity and between demographic data and pain intensity. The Statistical package for Social sciences (SPSS 16 Inc, Chicago) was used for all data analyses. Alpha level was set at $p=0.05$.

Results

Shown in Table I, is the demographic data of respondents, 16 % of the respondents were male while 84% were female. 86% of the respondents are married, 2% are divorced and 12% of the respondents have other marital status (widowed). Presented in Table IV is the chi-square test of association between occupation and the level of physical activity. There was significant relationship between occupation and physical activity level of patients with knee osteoarthritis

($Z^2=17.701$, $p<0.05$).

According to Table V, 14% of the respondents had mild pain, 54% had moderate pain, 28% had severe pain, and 4% had very severe pain.

Table VI shows the chi-square test of association between gender and pain intensity. There was no significant relationship between gender and pain intensity ($Z^2=2.526$, $p>0.05$).

Presented in table VII is the summary of chi-square to test for association between physical activity level and pain intensity. There was no significant association between physical activity and pain intensity.

Considering occupation of the respondents, 24% are civil servants, 26% of them are traders, 10% are artisans, retirees are 36 % and 4% of the respondents are involved in other occupation such as being a traveler.

Table II shows the level of physical activity of respondents. 10% of the respondents have high level of physical activity which consists of 100% female. 60% of the respondents rank moderate in their level of physical activity; 50% male and 61.9% female. 30% of the respondents have low level of physical activity; 50% male and 26.2% females.

Table III shows association between gender and the level of physical activity in patients with knee osteoarthritis. Gender has significant association with the level of physical activity due to the fact that the p-values are below the level of significance ($p<0.05$).

Table I. Demographic data of respondents

Variables	Male		Female		Total	
	N	%	N	%	N	%
Marital Status						
Married	16	100	70	83.3	86	86
Divorced	0	0	2	2.4	2	2
Others	0	0	12	14.3	12	12
Occupation						
Civil Servant	2	12.5	22	26.2	24	24
Business	2	12.5	24	28.6	26	26
Artisans	2	12.5	8	9.5	10	10
Retired	10	62.5	26	31	36	36
Others	0	0	4	4.8	4	4
Total	16	100	84	100	100	100

Table II. Frequency distribution of physical activity level participants

P/A level	Male		Female		Total	
	N	%	N	%	N	%
High	0	0	10	11.9	10	10
Moderate	8	50	52	61.9	60	60
Low	8	50	22	26.2	30	30

Key: N=frequency; %=percentage

Table III. CHI-Square test of association between gender and the level of physical activity in patients with knee osteoarthritis

GENDER	Physical Activity Level			Total	Z ²	P-value
	High	Moderate	Low			
Male	0	8	8	16	17.701	0.024
Female	10	52	22	84		
Total	10	60	30	100		

Table IV. CHI-Square test for occupation and physical activity level of respondent

OCCUPATION	Physical activity level			Total	Z ²	P-value
	High	Moderate	Low			
Civil Servant	0	16	8	24	17.701	0.024
Business	4	14	8	26		
Artisan	2	8	0	10		
Retired	2	20	14	36		
Others	2	2	0	4		
Total	10	60	30	100		

Key: Z² = Chi-Square Value**Table V.** Frequency of pain intensity in respondents

Pain Intensity	Frequency	Percentage	Cumulative %
Mild pain	14	14.0	14.0
Moderate	54	54	68.0
Severe pain	28	28.0	96.0
Very Severe pain	4	4	100.0
Total	100	100	100

Table VI. CHI-Square test for occupation and pain intensity of participants

OCCUPATION	Pain intensity				Total	Z ²	p-Value
	Mild pain	Moderate pain	Severe pain	Very severe pain			
Civil Servant	6	8	8	2	24	30.089	0.000
Business	2	16	8	0	26		
Artisan	0	6	4	0	10		
Retired	6	22	8	0	36		
Others	0	2	0	2	4		
Total	14	54	28	4	100		

Table VII. CHI-Square test of association between physical activity level and pain intensity

Pain Intensity	Physical activity level			Total	Z^2	P-value
	High	Moderate	Low			
Mild Pain	2	8	4	14	7.575	0.271
Moderate Pain	8	30	16	54		
Severe Pain	0	18	10	28		
Very Severe Pain	0	4	0	4		
Total	10	60	30	100	7.575	

Discussion

The purpose of this study was to assess the level of physical activity of patients with knee osteoarthritis in South Western States of Nigeria and to examine the effect of socio demographic data on the physical activity and pain level of the participants

The study observed that 16% of the respondents were male while 84% were female. It could be inferred that majority of the respondents were female. Akinpelu et al (5) had reported earlier that in Nigeria, OA is more common in females than males (3.5:1) and the knee joint is more frequently affected.

Our finding was also supported with studies by Felson, (15) and Srikanth, (16), which stated that osteoarthritis of the knee affects a greater percentage of women than men.

Also Stitik et al, (2) reported that after the age 55 years, the prevalence of osteoarthritis increases in women in comparison with men. This was supported by the study of Ayis and Dieppe(1) that there is a strong relationship between knee OA and female gender. The higher incidence of osteoarthritis in women who are postmenopausal suggests that oestrogen deficiency increases the risk of osteoarthritis (17). Sixty percent of the participants were of moderate physical activity level which was found mostly among female.

There was also a significant association between gender and physical activity level. The significant association between gender and physical activity in our study was in consistence with the study of Azevedo et al (18) where they reported that men and women have different levels of physical activity. Other studies suggested that males are more active than females in leisure-time, although not all were consistent (19-21). More data showed contrarily that, when all domains of activity practice are considered, no gender differences are

observed (22).

There was a significant association between physical activity and occupation in this study. The finding of this study was in consonant with the review of Kirk and Rhodes (23). They found a positive relationship between occupational physical activity and leisure-time physical activity and concluded that there were convincing evidences to supports the premise that those employed in occupations demanding long work hours and low occupational physical activity were at risk of inactivity.

The significant association between pain intensity and occupation among the participants in this study was supported by the work of O'Reilly et al (24). They examined the relationship between knee pain and occupation in a community setting which consisted of 4057 men and women aged 40-80. They found that highest prevalence of pain was seen in carpenters and miners and concluded that increased risk of knee pain is apparent in occupations which are likely to involve knee bending and possibly heavy lifting.

The insignificant association between physical activity and pain intensity of participant in this study was in support with the study of Mansournia et al (25).

In their study where physical activity was measured using the Physical Activity Scale for the elderly, and outcomes were functional performance measured by the timed 20-meter walk test and self-reported knee pain measured by the Western Ontario and McMaster Universities Osteoarthritis Index. They concluded that physical activity has no effect on knee pain and may have either a very small effect or no effect on functional performance in adults with knee osteoarthritis. Occupation was found to be significantly associated with physical activity in this study.

Conclusion

It can be concluded from the study that more than average participants of the study were of moderate physical activity. Gender was associated with the physical activity level of the knee osteoarthritis patient and nature of job is associated with pain intensity but physical activity was not associated with pain intensity.

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Received: 25 January 2013

Accepted: 28 February 2013