Original Article

Physical activity level in patients with knee osteoarthritis visiting Dhulikhel hospital: A cross sectional study.

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ABSTRACT

Introduction: Physical activity is an important public health intervention to improve the health of persons with arthritis. Because of pain on mobility, Patient with knee osteoarthritis may be physically inactive as compared to population without osteoarthritis.

Objective: The objective of this study was to identify the level of physical activity in patients with knee osteoarthritis.

Methods: Patients with knee osteoarthritis meeting the clinical diagnostic criteria given by American college of Rheumatology were interviewed. Then physical activity of patient with knee osteoarthritis was classified into light, moderate and vigorous using global physical activity questionnaire. Nepali-version of numeric pain rating scale was also used in order to measure the pain intensity which was further classified into mild, moderate and severe pain. Data were further analyzed to find out the correlation between two measures.

Result: Out of 78, Patients with knee osteoarthritis, 19(24.4 %) were male and 59(76.6%) were female.79.5% of patient with knee osteoarthritis are involved in moderate level of physical activity. Among the knee osteoarthritis patient 16.7% had mild pain, 76.9% had moderate pain and 6.4% had severe pain.

Conclusion: Most of the knee osteoarthritis patients were involved in moderate level of physical activity. Work-related domain of physical activity contributed more to total physical activity as compared to leisure-time physical activity. And we found that there is no association between level of pain and physical activity in knee osteoarthritis patient.

Keywords: *Function, Knee, Osteoarthritis, Pain, Physical activity*

Introduction

Knee osteoarthritis (KOA) is a degenerative joint disease which involves the cartilage and surrounding tissues of the knee joint which leads to physical disability with advancing age.[1] It is not a disease of cartilage alone but also affects the whole joint, including articular cartilage, meniscus, ligament, and peri-articular muscle.[2] Patient with knee osteoarthritis often complains of pain and joint stiffness of affected extremity.[3] Because of pain on mobility, patient with knee OA may be physically inactive as compared to population without osteoarthritis.[4]

Physical activity(PA) broadly encompasses exercise, sports and physical activities done as part of daily living, occupation, leisure and active transportation.[5] Physical activity provides many health benefits; reduce the risk of chronic diseases such as hypertension, diabetes, stroke, and cancer. Similarly, it promotes healthy cognitive and psychosocial function.[6] Not only this, considerable research suggest that patient with KOA who were physically more active complained of less pain as compared to those who were physically less active.[7,8]

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European League against Rheumatism (EULAR) guidelines recommends that patient with knee osteoarthritis should engage in joint-friendly regular moderate to vigorous physical activity (aerobic; moderate: at least 150 min per week, or vigorous: at least 75 min per week, or a mixture of both, on at least five days a week summed to ≥600 MET-min/week best performed in bouts of at least 10 min).[9] According to the National health interview survey patient with arthritis were less physically active. More than 37% arthritic population is inactive in US.[10] Similarly, another study done in U.S. found that only 12.9% of men and 7.7% of women with radiographic knee osteoarthritis has met the recommended guidelines of physical activity. So, nowadays physical activity is considered as an important public health intervention to improve the health of persons with arthritis.[11]

However, there have not been any reported data about the physical activity status in patient with knee osteoarthritis in South Asian countries although several western studies reported of less physical activity in KOA which indicated the further need of study.

Methods

This observational cross-sectional study was carried out in the 78 patients with knee osteoarthritis visiting orthopedics and physiotherapy OPD. Non probability convenience sampling method was used and sample size was calculated using formula z^2pq/e^2.

Individuals with knee pain visiting physiotherapy outpatient department and orthopedics department were screened using on American college of rheumatology clinical diagnostic criteria. American college of rheumatology clinical diagnostic criteria consists of following criteria.

1. age≥ 50,
2. morning stiffness > 30 minutes,
3. bony tenderness,
4. bony warmth,
5. bony enlargement and
6. Crepitus.

Patient with knee pain presenting at least three of above mentioned six criteria were considered as eligible participants. Eligible participants were provided a subjective information sheet explaining the objective of the study, benefits, harms, right to withdraw, time taken to complete the form and confidentiality. After the participants agreed to participate, written and verbal informed consent was taken from every participants. People who didn't give consent were excluded from this study. Those who gave consent were interviewed Nepali version of numeric pain rating scale (NPRS-NP) and global physical activity questionnaire(GPAQ). GPAQ was analyzed using GPAQ analysis guide and physical activity was categorized as low, moderate and vigorous physical activity and pain intensity was classified as mild,moderate and severe(12–14)moderate, and severe pain in terms of pain-related interference with functioning in patients with chronic musculoskeletal pain, to measure the variability of the optimal cut-offpoints, and to determine the influence of patients' catastrophizing and their sex on these cut-offpoints. Methods: 2854 patients were included. Pain was assessed by the NRS, functioning by the Pain Disability Index (PDI. The demographic data of participants was recorded.

GPAQ collects information on physical activity participation in three settings (or domains) as well as sedentary behavior, comprising 16 questions. The domains are activity at work travel to and from places, recreational activities.It has good test-retest reliability.[15] Numeric pain rating 11-point scale for patient self-reporting of pain where 0 means "no pain" and 10 means "worst imaginable pain." It is used for assessing pain severity. It has good internal consistency and test-retest reliability.[16]

The data collected was tabulated and analyzed by using the Statistical Package for Social Sciences(SPSS) version 23. Findings were described in terms of percentage. Chi-square test was used to see the association between pain intensity and physical activity level.

Results

Characteristics of study sample

The demographics parameters of participants are summarized in table 1. The mean age of patient with knee osteoarthritis was 56 years. The maximum numbers of patients were in age group 61-70 years. Female patients with knee osteoarthritis were more than male patients. Most of the patients with knee osteoarthritis were housewife which is then followed by involvement in agriculture. More than half of the populations were married.

Table 1: Distribution according to demographics

Characteristics	Total Sample (n=78)
Sex	n(%)
Male	19 (24.4)
Female	59 (76.6)
Age range (yrs)	
31-40	7 (9)
41-50	19 (24.4)
51-60	19 (24.4)
61-70	26 (33.3)
71-80	6 (1.7)
81-90	1 (1.3)
Occupation	
Self-employed	14 (17.9)
Government job	3 (3.8)
Housewife	32 (41)
Agriculture	29 (37.2)
Marital status	
Married	69 (88.5)
Widow	9 (11.5)
Ethnicity	
Newar	25 (32.1)
Brahmin	20 (25.6)
Chhetri	7 (9)
Tamang	12 (15.4)
Magar	5 (6.41)
Others	9 (11.5)

Most of the patients with knee osteoarthritis were involved in moderate level of physical activity. But total PA was mostly contributed by work related and travel related domain of PA as compared to leisure time PA. (Table 2)

Table 2: Domain specific contribution to total PA, WHO recommended PA along with achieved physical activity level

MET min of PA in a week	Minimum	Maximum	Mean	Standard deviation
Work	0	12960	2160	2970.966
Travel	360	8400	3460	1599.734
Recreational	0	3360	406.15	642.514
Total	840	16320	6026.15	3463.808

Level of physical activity	n(%)
Low	NA*
Moderate	62 (79.5)
Vigorous	16(20.5)

The average pain intensity was 5.19. And about 3/4th patients with knee osteoarthritis experienced moderate pain. And, association between pain and physical activity was statistically not significant. (Table 3)

Table 3: Distribution by pain severity and association between physical activity and pain severity

Physical Activity	Pain Severity		
	Mild Frequency (%)	Moderate Frequency (%)	Severe Frequency (%)
Low	NA*	NA*	NA*
Moderate	8 (10.3)	50 (64.1)	4 (5.1)
Vigorous	5 (6.4)	10 (12.8)	1 (1.2)

Chi-square test	p-value
Correlation between Pain and physical activity	0.21*

*Not significant

Discussion

This cross-sectional aimed to identify the level of physical activity and the extent to which physical activity is affected by pain severity in patients with knee osteoarthritis. This study found that most of the patient with knee osteoarthritis is involved in moderate level of physical activity. In addition, all the patients included in this study met the recommended guidelines of physical activity in arthritic population. Various studies about physical activity level on healthy population in Nepal also showed higher physical activity as compared to studies done in other countries.[17,18] And about 3/4th population with knee osteoarthritis complained of having moderate pain. Current study showed that the proportion of patients involved in physical activity decreases with increasing age which is similar to other studies. Ramires VV et al and Buchman et al found that with increasing age, there is decrease in physical activity.[19,20]

Physical activity level in the current study is higher than the previous studies conducted in different countries. Shim HY et al found that 61.1% were inactive and 25.9 % were minimally active in patient with knee osteoarthritis in Korea.[21] Similarly, another study done in united states found

that only 23.6% of population with knee osteoarthritis were involved in moderate physical activity and 0.95 % were involved in vigorous physical activity.[22] The percentage of population meeting the recommended guidelines for physical activity in knee osteoarthritis is also higher than previous studies done in different countries, in US, only 12.9% of men and 7.7% of women with radiographic knee osteoarthritis have met the recommended guidelines of physical activity and in Korea, only 23.4% had met the recommended guidelines.[11,21]

Variation in level of physical activity in our study might be due to factor affecting physical activity. Different studies have found that differences in infrastructures, occupational variation as well as geographical variation, temperature variation and countries' national income are responsible for differences in physical activity level. Higher physical activity in our study may be due to occupational activity because more than half of the patients were involved in agriculture and household activities which require more manual labor.[23–25] According to WHO, countries with lower national income had higher physical activity as compared to countries with higher national income.[26] These result contrast from the study by Kari JT et al and Armstrong S et al. In their study, they found that people with higher income tend to have gym membership and more physical activity facility resulting in higher physical activity.[27,28] One study found that countries with lower national temperature have more moderate to vigorous physical activity and vigorous physical activity.[29] In contrary, other studies found that increase in temperature increases physical activity.[30–32]

Together our result found that most of the people with knee osteoarthritis are involved in moderate level of physical activity because many of them are involved labor intensive occupation. Work-related domain of PA contributed more to total PA as compared to recreational domain of PA. Increase in temperature, low annual income, occupation and social support are the factors facilitating physical activity.

There are some limitations in our study. First, we use a self-reported questionnaire to know about a physical activity level which may result in information bias. Second, instead of activity monitors such as accelerometers to measure physical activity, we used self-reported GPAQ. However, GPAQ is a valid tool for assessing physical activity level(15). There might be possibility of participants' inability to recall events 7 days prior to data collection while responding to the questions on GPAQ. Third, the result couldn't be generalized to whole population because sample size is small due to time limitation during data collection.

Conclusion

In our study, most of the patients with knee osteoarthritis were engaged in moderate level of physical activity which is followed by vigorous physical activity. But total physical activity in our study was mostly contributed by work-related physical activity. Hence in clinical setting, patients with knee osteoarthritis should be encouraged to involve in leisure-time physical activity which will have positive effect on pain, physical function, mental health and health related quality of life. Similarly, association between pain and physical activity was statistically not significant.

Recommendation

This study recommends to examine whether patient with knee osteoarthritis are involved in appropriate and joint-friendly physical activity or not by using objective measure of physical activity.

List of Abbreviations

PA: Physical activity

OA: Osteoarthritis

KOA: Knee osteoarthritis

GPAQ: Global Physical Activity Questionnaire

MET: Metabolic Equivalent

NPRS-NP:Nepali version of Numeric Pain Rating Scale

SPSS: Statistical Package for Social Sciences

WHO: World Health Organization

EULAR: European League against Rheumatism

OPD: Out-patient Department

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