Association Between Patient's Characteristics and Hamstring Flexibility in Patient with Knee Osteoarthritis

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Highlights:

- Osteoarthritis is most common skeletal disease.
- Patients characteristics such as occupation have association with hamstring muscle in osteoarthritis

Abstract:

Knee osteoarthritis is most common among patients. Patients with knee Osteoarthritis usually have pain, brittle bone and felt difficulty during movement. Mostly individuals after forty years of age have felt the symptom of knee osteoarthritis.

Objective:

The objective of this study was to find out the association between patients characteristic and hamstring flexibility in knee osteoarthritis.

Methodology:

This was a Cross sectional study. One hundred and one patients were selected from rehabilitation center of Allied Hospital. Six month were taken for completion of this study. Participants with knee osteoarthritis (stage 1 & 2), age forty to sixty five years were involved in this study if they had nerve related issues, bone or muscle related disorder were not counted in this study. Subject's characteristics such as their profession, age, pain location as well as duration of pain related questions were asked from patients. Active knee extension test was used for recording the hamstring length. Chi square test was used to determine the association.

Results:

Men were 38(37.6%) and women 63(62.4%). Occupations of patients had influence on hamstring flexibility ($P<0.000$) while patient's age ($P<0.071$) durations of pain ($P<0.856$) and pain region ($P<0.956$) had not associated with hamstring flexibility.

Conclusions:

It is concluded that patient's characteristic in which only occupations of patients had compromised the hamstring flexibility in knee osteoarthritis subjects rather than age, duration of pain and pain region.

Key words:

Patient's characteristics, hamstring flexibility, Osteoarthritis

Introduction:

Knee osteoarthritis is most common among patients. Patients with knee Osteoarthritis usually have pain, brittle bone and felt difficulty during movement. Majority of individuals after forty years of age have felt the symptom of knee osteoarthritis. Approximately 3.8 present of the people around the globe having the knee osteoarthritis which is equalize to two hundred and seventy seven individuals that have been experience the knee Osteoarthritis.[1 2 3 4] Individuals with overweight also have linked with knee osteoarthritis. Body over weight affects the knee mechanic or exerts pressure on joint and individuals have complained of arthritis. Females are more suffered from Knee Osteoarthritis as compared to males due to overweight issues.[5] Some studies stated that higher blood pressure and glucose level also affects the knee joint as well as subject with this issue have complained to knee osteoarthritis.[6 7]

Knee osteoarthritis cause pain and functional disability worldwide.[8] OA frequency increases with the passage of time so strategies are necessary to be taken to reduce the impact of knee osteoarthritis on patients through primary and secondary prevention.[9] Osteoarthritis is most common between middle aged populations whose reduced quality of life and loss to productivity leads to high disease cost.[10] Personal and economic factor cause widespread pain, but its etiology is not exact known. Longitudinal studies describe that anxiety, cognitive decline, poor sleep, and multi joint osteoarthritis, poor health-related quality of life (QOL) baseline pain status, older age and a family history of chronic pain all are the risk factor for widespread pain. However both non modifiable and modifiable risk factors have been recognized but exact mechanisms through which these risk factors may lead to widespread pain have not been investigated.[11] A cross-sectional study of patients with knee osteoarthritis show a relation among high pain severity and low-grade radiographic knee OA[12], declared that may be pain itself rather than structural pathology may lead to widespread pain. Hamstring muscle played important role in maintenance of knee joint function during walking or any physical activity. Hamstrings muscle produced the hip extension and knee flexion there are many factors that cause or linked with knee osteoarthritis. But the reason to conducted this study have to evaluated the subjects demographic characteristic either have linked with or not to hamstring flexibility in knee osteoarthritis because subjects occupational level and activity level both have impact on knee joint or muscle activity and disturbed their knee joint mechanic and articular joint as well as bone. So, the objective of this study was to evaluate either the subject's characteristic have association with knee osteoarthritis or not.

Methodology:

This was the descriptive cross sectional study. Sampling technique was purposive sampling. Patients' information was obtained from rehabilitation center of Allied hospital Faisalabad after taking the ethical approval letter. One hundred and one patients were participated in this study. Permission forms were signed from all patients to take part in this study. Participants with knee osteoarthritis (stage 1 & 2), age forty to sixty five years were involved in this study if they had nerve related issues, bone or muscle related disorder were not counted in this study. AKT (active knee extension test) was used to evaluate the hamstring muscle length.[13] Participant's demographical data were obtained by asking questions about their duration of pain, their occupation, location of pain and age. Chi square test was used to find out the association between participants characteristic with hamstring muscle flexibility

Results:

The total sample size was 101. Out of 101 (100%) males were 38(37.6%) and females 63(62.4%). Majority of the respondents 27.7 %(28) were belongs to 40 to 45 years age group. Chi square test showed that there was no association between age of respondents and hamstring flexibility in knee osteoarthritis (P<0.071). Majority of respondents 42(41.6%) had pain in patellofemoral joint. So, there was no association between pain region and hamstring flexibility in knee osteoarthritis (P<0.965).

Table 1

Variable	Frequecny/Percent	P value
Age		
40-45	28 (27.7%)	
46-50	21 (20.8%)	
51-55	17 (16.8%)	0.071
56-60	16 (15.8%)	
61-65	19 (18.8%)	
Pain Region		
Patellofemoral joint pain	42 (41.6%)	
Tibiofemoral joint pain	23 (22.8%)	0.956
Bilateral joint pain	36 (35.6%)	

Table 1: Descriptive statistics and Association of age and pain region with hamstring flexibility

Mostly respondents were females, and they were housewives. Housewives 52(51.5%) were mostly facing the knee problems. Secondly there were

workers and thirdly businessmen who were facing the knee problems. They both were 10(9.9%) and 9(8.9%) of the total respondents. These all individuals had hamstring tightness so; there was association of occupations with hamstring flexibility in knee osteoarthritis (P<0.000).

Variable	F/Percent	P value
Occupations		
Businessman	9 (8.9%)	
Designer	1 (1.0%)	
Driver	2 (2.0%)	
Electrician	1 (1.0%)	
House wife	52 (51.5%)	
Jeweler	1 (1.0%)	
Lawyer	1 (1.0%)	
Milkman	1 (1.0%)	
Nurse	1 (1.0%)	0.000
Peon	1 (1.0%)	
Policeman	1 (1.0%)	
Radiologist	1 (1.0%)	
Retired	1 (1.0%)	
Retired officer	1 (1.0%)	
Security guard	3 (3.0%)	
Servant	6 (5.9%)	
Tailor	2 (2.0%)	
Teacher	6 (5.9%)	
Worker	10 (9.9%)	

Table 2: Descriptive statistics and Association between Occupation and hamstring flexibility

Many of the respondents 20.8 %(21) were facing the knee problems for last 2 months. 14.9 %(15) of the respondents were facing the knee problem since last one month. 12.9 %(13) of the respondents were facing the knee problem from last 3 months. So there was association between duration of pain and hamstring flexibility in osteoarthritis (P<0.856).

Table 3

Variable	F/Percent	P value
Duration of pain		
2 Days	1(1.0%)	
10 Days	1 (1.0%)	
15 Days	2 (2.0%)	
1 Week	3 (3.0%)	0.856
2 Week	7 (6.9%)	
3 Week	4 (4.0%)	
6 Week	5 (5.0%)	
8 Week	2 (2.0%)	
1 Month	15 (14.9%)	
1.5 Month	2 (2.0%)	
2 Month	21 (20.8%)	
2.5 Month	1 (1.0%)	
3 Month	13 (12.9%)	
3.5 Month	1 (1.0%)	
4 Month	3 (3.0%)	
5 Month	5 (5.0%)	0.856
6 Month	7 (6.9%)	
8 Month	2 (2.0%)	
9 Month	1 (1.0%)	
1 Year	1 (1.0%)	
2 Years	1 (1.0%)	
5 Years	2 (2.0%)	
15 Years	1 (1.0%)	

Table 3: Descriptive statistics and Association between pain duration and hamstring flexibility

Discussion:

This study reported that subject's characteristics such as occupation and duration of pain had compromised the hamstring flexibility while the pain regions and age had not compromised the hamstring flexibility in knee osteoarthritis patients. It means patients occupation and duration of pain had associated with hamstring flexibility. Fitzgerald et al claimed that subject's physical feature (muscle power) or outward form, lineament or non-physical or intellectual factor, emotional states had also linked with knee OA disease. If this entire element were changed in subjects their pain sensation and activity level compromised with passage of time. All subjects' information was getting by WOMAC questionnaire **(**Western Ontario and McMaster Universities Osteoarthritis Index).[14] This present study also reported the result that activity level compromised during occupation had influence on hamstring extensibility. Tharakan et al explained that tibiofemoral degradation had compromised the strength of hamstring muscle. They had also compromised the function of knee joint (P<0.001) in knee OA patients as well as their pattern of walking. They had evaluated the muscle flexibility by PKET (passive knee extension test. This study results showed that tibiofemoral joint pain had not compromised the hamstring extensibility in knee OA patients. But duration of pain affects the

knee mechanic and flexibility of hamstring muscle (P<0.000).[15] But this present study also showed that tibiofemoral joint pain had not any effect on hamstring length (P<0.956). But duration of pain had not support the previous study because it had not compromised the hamstring flexibility (p=0.865). Abolahrari et al proclaim that muscles that are inserted at the knee joint had been affected in knee arthritis patients. This study was done on 23 normal females. VAS was used for pain. This study concluded that muscle lengths were compromised in this disease patient due to pain (P<0.0001)[16] and duration of pain also affected the muscle flexibility especially of hamstrings (P<0.0001). But in this latest study a hamstring muscles were also affected (P<0.000) while duration of pain had not affected the hamstring muscle group in knee OA patients. King et al showed that overweight or obesity also had relation with knee OA disease because over weight affect the joint and their load shift result in joint dreadful conditions, lead to continuance of this disease (P=0.039). More muscle mass progress the cartilage obliteration as well as inner bone mass[17] if overweight is reduced OA subject relived from pain.[18] [19] But this study had not told about the overweight or obesity either compromise the flexibility or not. A study of Bednarz et al result showed that occupation had effect on knee joint mechanic as well as hamstring muscle length. Different functional activities while doing their work affect muscle flexibility (P<0.002).[20] This present study results also support this study because occupations of subjects had relation with hamstring muscle flexibility (P<0.000)

Conclusions:

In case of knee osteoarthritis, patient's characteristic in which only occupations of patients had association with hamstring flexibility rather than age, location of pain and pain region.It is recommended to conduct a research to find out the association of BMI with hamstring flexibility in osteoarthritis patients with large sample size.

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