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Correlation of Pain, Physical Function and Balance with Kinesiophobia in Patients with Unilateral Knee Osteoarthritis: A Cross-Sectional Study

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ABSTRACT

Aim: The study aimed to find the correlation of pain, function and balance with kinesiophobia patients with unilateral knee osteoarthritis.
Method: A cross-sectional study using purposive sampling was conducted in 60 knee osteoarthritis patients. Pain was assessed using NRS, physical function was assessed using 30 secs chair stand test, stair climb test and 40m fast-paced walk test. Balance, disability and kinesiophobia was assessed using Community balance and mobility scale, Oxford knee score, and Tampa scale of kinesiophobia respectively.
Results: There was no correlation of kinesiophobia with pain (r = 0.015, p = 0.910), 30 seconds chair stand test (r = -0.108, p = 0.410), stair climb test (r = 0.239, p = 0.066), 40m fast paced walk test (r = 0.083, p = 0.531), balance (r = -0.081, p = 0.539) and disability (r = -0.237, p = 0.068).
Conclusion: The study concluded that kinesiophobia does not correlate with pain, function and disability in patients with unilateral knee OA.

Keywords: disability, function. kinesiophobia, osteoarthritis

INTRODUCTION

Osteoarthritis (OA) is a degenerative joint disease that affects the cartilage and surrounding tissues. [1] It most commonly occurs in knee, hip, hand, foot and spine. [2,3] Prevalence of knee osteoarthritis in India is 28.7%. [4] The common clinical features seen in osteoarthritis are pain in joints, stiffness, crepitus, reduced range of motion, varying degree of local inflammation and reduced function. [5,6] As many knee OA cases are increasing, we need to improve our understanding about the disease and related factors to target various treatment strategies. [7]

Kinesiophobia is defined as 'an excessive, irrational and debilitating fear of physical movement and activity resulting from the feeling of vulnerability to painful injury or re-injury.' [8,9] Performance of activities of daily living is limited due to pain which has an impact on function and quality of life. [10,11] On the contrary individuals with kinesiophobia may be hesitant to initiate activity. [10,11] It has been shown that osteoarthritis patients who have pain related fear, report more pain and thus there is increased level of disability. It is important to evaluate kinesiophobia in knee OA [11-16] as it can be one of the essential therapy modifiers which will be helpful in delivering patient specific treatment. [7,17]

Kinesiophobia is one of the psychosocial factors which should be taken into

consideration while assessing knee OA patients as it can be used for individual patient treatment. Cognitive behavioral model of fear of movement suggests that for some patients experience pain that can lead to fear of movement. [9] Also in long term, avoidance of movement, and physical activity might result in physical and psychological changes which then ultimately will contribute for increased pain (9) Thus, the need of the study was to correlate kinesiophobia with pain, function and quality of life in knee OA patients.

MATERIALS & METHODS

The study was carried out after obtaining approval of the Institutional Ethical Committee. Sixty participants were recruited from physiotherapy outpatient department at tertiary health care centre. Screening was done based on inclusion and exclusion criteria. Before enrolling, participants were explained about the study procedure and informed consent was obtained. The demographic information of participants was noted. Subjects diagnosed with unilateral knee osteoarthritis as per American college of Rheumatology criteria were included in the study. [18] Subjects above 70 years of age, presence of rheumatoid arthritis or any other systemic inflammatory arthropathies, any knee surgeries, history of any neuromuscular conditions, subjects on corticosteroids within previous three months were excluded from the study.

Pain intensity was measured using the Numerical Rating Scale (NRS). Kinesiophobia was measured using the Tampa scale for kinesiophobia (TSK). It contains 17 items and is a 4-point scale from 'strongly agree' to 'strongly disagree'. Total scores range from 17 to 68. Scores with 37 or less suggest low fear of movement, more than 37 suggests high fear of movement. [1]

Physical function was assessed using 30 seconds chair stand test, 40m fast-paced walk test and Stair climb test. For 30 seconds chair stand test, participants were asked to stand up completely so that hips and knees are fully extended, and then completely back down so that the bottom touches the seat. The number of times participants were able to do the same was measured. [19]

For, 40m fast-paced walk test, a 10m walkway was marked using tape and coloured cone were put on either end of the course. Participants were instructed to walk as quickly as possible but do not run along a 10m and then turn around a cone, and return for a total distance of 40m. The time required to complete the tasks was recorded in seconds. [19] For Stair climb test, participants were asked to ascend and descend a flight of stairs as fast as possible. The recommended step height is 16-20cm and wherever possible 9 stair steps were there in a 1 flight of stairs. Time was recorded in seconds. [19]

Balance was evaluated using Community Balance and Mobility scale. It comprises of 13 tasks, including bending, turning, or looking while walking; single-leg standing; and stair descent. The maximum score is 96, with a minimum score of 0. [20] Disability was evaluated using Oxford knee score, a 12-item questionnaire, that addresses pain and functional impairment. [21]

STATISTICAL ANALYSIS

Statistical analysis was performed using the SPSS version 24. Normality testing was done using the Shapiro-Wilk test. As the data was not normally distributed, non-parametric test was used. Spearman's correlation test was used to assess correlation between the variables. The level of significance was considered to be 0.05.

RESULTS

The demographic characteristics of the participants are described in Table 1. Of 60 participants, 65% (n= 39) were females and 35% (n = 21) males.

Table 1: Demographic characteristics of the participants.

Variable	Mean	Standard deviation
Age (years)	57.38	5.89
Height (cm)	159.85	9.41
Weight (kg)	69.44	8.52
BMI (kg/m2)	27.41	4.62

The mean and standard deviation values of all the variables are depicted in Table 2

Table 2: Mean and standard deviation values of all variables.

Variable		Mean	Standard deviation
Pain	NRS	5.57	1.06
Physical Function	30seconds Chair Stand Test	8.03	2.16
	Stair Climb Test	17.53	4.90
	40m Fast Paced Walk Test	39.40	7.35
Balance	Community Balance and Mobility Scale	43.57	9.28
Disability	Oxford Knee Score	31.78	6.89
Kinesiophobia	Tampa Scale of Kinesiophobia	40.75	4.00

There was no correlation between pain and kinesiophobia. There was no correlation between kinesiophobia and 30seconds chair stand test, stair climb test and 40m fast paced walk test. There was no correlation of kinesiophobia with balance and disability. Also, no correlation was observed between kinesiophobia and quality of life including physical and mental component summary. (Table 3)

Table 3. Correlation of Kinesiophobia with pain, function and disability in OA knee patients.

Variable		Kinesiophobia	
		r value	p value
Pain	NRS	0.015	0.910
Physical Function	30seconds Chair Stand Test	-0.108	0.410
	Stair Climb Test	0.239	0.066
	40m Fast Paced Walk Test	0.083	0.531
Balance	Community Balance and Mobility Scale	-0.081	0.539
Disability	Oxford Knee Score	-0.237	0.068

DISCUSSION

The results from the present study indicated that there was a no correlation of kinesiophobia with pain, function and quality of life in patients of unilateral knee OA. It is important to know that pain experienced by an individual can be influenced by multiple factors such as structural, physical and psychosocial which are different for different individuals. [7,22] Recently, it is suggested that, altered nociceptive processing mechanism plays an important in knee OA pain. [23,24] It primarily focusses on sensitization of central nervous system with psychosocial factors playing a vital role as compared to biomechanical and structural factors. [24-26] But, the individuals predominately having nociceptive pain are more affected by biomechanical and structural factors. Thus, different individuals having knee OA will experience pain for different reason.

A recent study reported that there was no association between pain and fear of movement while controlling the other variables suggesting that pain reduction is not the only criterion for reducing fear of movement in knee OA patients. [27] Few studies reported that psychological resilience and positive emotions have an important role and can influence the reaction to pain in an individual. [28,29] Also, in the present study, 65% of participants were females and it is already proven by Muraki et. al that females have a similar or higher threshold for pain than males, so this could be a justification to the findings that pain intensity did not correlate to kinesiophobia. [30]

The present study revealed no correlation of kinesiophobia with physical function and balance. As reported by Scopaz et al. kinesiophobia and anxiety affects physical activity in patients with knee OA. [31] Also, Kilinc et al. also reported similar results showing a significant relationship between the level of activity and kinesiophobia and fear of movement can be an important predictor for the level of physical activity. [32]

Domenech et al. reported that kinesiophobia significantly correlated with pain and disability in anterior knee pain. [33] Heuts et al. suggested that in patients with knee OA

the pain-related fear was negatively associated with activities of daily living which can lead to disability. [14] However, in the present study, there was no correlation between kinesiophobia and disability.
Kinesiophobia should also be considered while assessing knee OA patient. Kinesiophobia should be addressed in management of knee OA, with individual treatment considerations for each patient.

CONCLUSION

The study concluded that there is no correlation of kinesiophobia with pain, function, balance, disability and quality of life in patients of unilateral knee OA.

Declaration by Authors

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