

Correlation of Fears and Beliefs About Knee Osteoarthritis with Balance in Patients with Osteoarthritis of Knee

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Abstract:Background: Knee osteoarthritis (OA) damages the proprioceptors within the joint cavity which in turn may lead to impairment of balance, an integral part of mobility. Fears and beliefs about knee osteoarthritis in patients with knee osteoarthritis are found to have an adverse impact on their function. Objectives: The study aimed to evaluate the correlation between fears and beliefs about knee osteoarthritis and balance in patients with Knee OA. Material and Methods: In an observational analytical study males and females with OA knee were included. Fears and beliefs were assessed using the Knee Osteoarthritis Fears and Beliefs Questionnaire (KOFBeQ), balance was tested using the Functional Reach Test (FRT) and pain was assessed by Visual Analogue Scale (VAS). Result: Forty-six patients were evaluated. Mean pain score was 4 ± 1.5 , FRT score 8.7 ± 2.4 inches, KOFBeQ score 33 ± 13.8 . Correlation was found using Spearman coefficient, $r=0.178$, $p=0.23$ (balance and KOFBeQ), $r=-0.264$, $p=0.7$ (pain and balance), $r=-0.3$, $p=0.018$ (pain and KOFBeQ) was seen. Conclusion: Fears and beliefs about knee osteoarthritis were present with impaired functional balance. Weak negative correlation was found between pain and balance and pain and fears and beliefs and no correlation were found between balance and fears and beliefs. [Bhatt P Natl J Integr Res Med, 2021; 12(3): 25-29]

Key Words: Functional Reach Test, Knee OA, KOFBeQ.

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Introduction: Osteoarthritis (OA) is one of the most common diseases of the skeletal system, and can be defined as a degenerative condition affecting synovial joints, being the most prevalent form of joint disease, which does not lead to systemic involvement, without associated mortality¹. Considering the high prevalence of knee OA and the disease's influence on disability, it is important that clinicians understand factors that can impact effectiveness of treatment in people with osteoarthritic knees.

Impaired proprioception and compromised balance control are also common in people with osteoarthritic knees. Further, physical function in people with osteoarthritic knees may be affected when balance is compromised because balance is essential for everyday activities that range from maintenance of static positions to complex dynamic activities².

The knee is the most commonly injured weight bearing joint, and OA of the knee is known to be a risk factor for fall injuries. Therefore, it would be valuable for OA patients to receive education related to preventing falls and rehabilitative training after evaluating their balance control abilities³.

In addition to the age-related changes patient with Osteoarthritis of knee have, alteration in the normal knee alignment causing a biomechanical change, decreased quadriceps muscle strength and altered pattern of muscle recruitment. Pain associated with knee OA may play a role in balance impairment and sway increase generating a reflex inhibition of knee muscles which yields an ineffective and imprecise response related to postural control.

Furthermore, knee pain could result in lower weight bearing by affected joint, preventing the ability of a person with knee OA to maintain the centre of mass inside the base of support⁴.

Fears and beliefs about knee osteoarthritis in patients with knee osteoarthritis are found to have an adverse impact on their function¹.

Various psychosocial factors mainly related to a fear avoidance model may have important implications in the balance and stability of patients with osteoarthritis of knee⁵. The fear-avoidance model proposes that pain perception is primarily influenced by pain-related fear and pain catastrophizing.

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High levels of pain related fear and pain catastrophizing are associated with an avoidance behavioural response, which is believed to be a precursor to developing a chronic disability⁵.

Knee osteoarthritis (OA) damages the proprioceptors within the joint cavity which in turn may lead to impairment of balance which is an integral part of mobility². Individuals who experience pain related fear are likely to engage in avoidance behaviours, specifically avoidance of movement and physical activity.

Recent evidence demonstrated the role of muscle weakness and chronic pain as elements that decrease balance and alter postural stability, which also increase this risk. Research estimates that 27% of the population with knee OA are at risk of having sensations of instability, and 18% actually experience buckling⁵.

Maintaining a sufficient level of activity and exercise is critical for managing the pain and disability associated with OA; however, OA patients who fear engaging in painful movements may be hesitant to initiate or engage in daily activity or exercise.

In this way, pain-related fear contributes to a vicious cycle of a more restricted and physically inactive lifestyle adopted to avoid pain, paradoxically leading to increased pain and disability⁶. Fears and beliefs of patients concerning knee osteoarthritis management have been less studied⁷.

The study aimed to evaluate the correlation between fear and beliefs about knee osteoarthritis and balance in patients with Knee OA.

Material & Methods: A cross sectional study was conducted at SBB college of Physiotherapy, Ahmedabad. Permission to conduct study was obtained from the head of the institute.

Forty-six patients diagnosed with Osteoarthritis of knee by orthopaedic department were recruited for the study. Males and females aged > 40 years, diagnosed with unilateral / bilateral OA and those willing to participate were recruited in the study.

Patients with neurological conditions and with balance disorders were excluded. Patients

meeting the inclusion criteria were selected. The study was explained and written informed consent was obtained. Severity of the OA knee was recorded using KL (Kellgren and Lawrence) grading. Modified Kupp swamy scale was used for identifying the socioeconomic status of the patient.

Outcome Measures Used Were: Fears And Beliefs About Knee OA: Fears and beliefs concerning knee OA were assessed by the 11- item Knee Osteoarthritis Fears and Beliefs Questionnaire (KOFBeQ). One total score(0–99) was computed.

The questionnaire explores important domains of fears and beliefs that may have an impact on the burden of the disease and its management.

The questionnaire studies domains like beliefs regarding daily living activities, physician, disease, and sports or leisure activities⁷.

Dynamic Balance: Participants' dynamic balance was assessed by using the Functional Reach Test (FRT)The validity and test-retest reliability ($r = 0.71-0.94$, respectively) of data for the FRT have been established⁸.

Pain: VAS (Visual Analogue Scale) was used to measure the pain.

Statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 16.

Spearman's correlation coefficient test was used to identify the correlation between the fears and beliefs about knee OA and dynamic balance of the patients. Level of significance was kept at 5%.

Results: Data of 46 patients was collected and analysed. Table 1 shows the demographic details of the participants. Mean KOFBeq score, Pain intensity and FRT scores are show in Table 2.

Correlation analysis is shown in Table 3.

The result showed presence of fears and beliefs about osteoarthritis of knee in patients with knee OA along with impaired functional balance.

There was no significant correlation seen between fears and beliefs about knee osteoarthritis and functional balance.

Weak negative correlation was found between pain and balance and pain and fears and beliefs about knee osteoarthritis.

Table 1: Demographic Data

Demographics		
	Mean±SD	Median
Age (Years)	61.3±9.7	-
Gender(M/F)	11/35	-
BMI (kg/cm ²)	27.9±4.5	-
Socioeconomic status	-	3(III)
Duration of OA (Years)	4.57±4.0	-
KL score	-	3
No. of Comorbidities	-	1

Table 2: Outcome Measures (Mean Score)

Outcome Measure	Mean±SD
KOFBeQ Score	33 ±13.8
FRT (Inches)	8.7±2.4
Pain(VAS)	4±1.5

Table 3: Outcome Measures (Correlation Coefficient Values; P <0.05)

Correlations		
Outcomes	r value	p value
KOFBeQ& FRT	0.178	0.23
Pain & FRT	-0.264	0.7
Pain &KOFBeQ	-0.3	0.018
Age & FRT	0.21	0.28
Age &KOFBeQ	0.1	0.49

Discussion: The result of the present study shows that there is presence of fears and beliefs about osteoarthritis of knee in patients with knee OA along with impaired functional balance. There was no significant correlation seen between fears and beliefs about knee osteoarthritis and functional balance. No significant correlation was observed of pain and age with functional balance and fears and beliefs about Knee OA.

Contrary to present findings a study by Bhatt et al found a moderate to strong correlation between fear avoidance beliefs with severity of pain and function respectively and a strong correlation between severities of pain with function in subjects with OA knee¹.

Results of a study suggests that fear of falling in people with knee instability is a common consequence of knee OA and may contribute to poor functional outcomes of the disease. Poor

balance and increased fear of falling is associated with decreased physical function even in people who have not had a fall.

Fear of falling is likely a reason that such a high proportion of those with knee instability limit their activities out of concern about buckling⁹.

Present study showed no correlation between age and functional balance. A study found that age had significant inverse correlation with balance in participants with unilateral knee OA and age, BMI, self-reported function as major predictors of physical function in individuals with knee OA². A study by Hsieh et al. showed that older patients with knee osteoarthritis displayed greater postural instability compared with younger patients. Aging is associated with increased comorbidities, reduced ability to perform basic and instrumental activities of daily living, and increased dependence on others.

Age-related neuromuscular system impairment (e.g., anabolic and catabolic hormone disturbances, muscular atrophy, changes in muscle neural activation) contributes to reduced postural stability in patients with knee osteoarthritis⁽¹⁰⁾. A study by Kim et al. reported that moderate to severe OA patients had diminished balance control compared to mild OA patients and a decrease in muscle strength, proprioception, and increased pain contributes to postural instability³. Weak negative correlation was found between pain and balance and pain and fears and beliefs about knee osteoarthritis. Moderate pain was observed in the participants of the present study.

A previous study comparing knee OA patients with sex and age-matched controls showed that pain and muscle strength affects postural sway as the quadriceps femoris muscle strength and proprioception decreased and postural sway increased in the knee OA group³. Fears and beliefs about knee OA were present among the participants of the present study. Pain-related fear occurred to a considerable extent in a sample of osteoarthritis patients and was negatively associated with daily functioning. Level of pain and level of pain-related fear are significantly associated with functional limitations¹¹. Hearn et al found fear avoidance beliefs negatively correlated with postural stability⁵.

George SZ et al, in their study investigated fear-avoidance beliefs and musculoskeletal pain across 4 anatomical regions (cervical spine, lumbar spine, upper extremity and lower extremity) found similar levels of fear-avoidance beliefs across these 4 anatomical regions.

Furthermore, they found that elevated fear-avoidance beliefs were associated with higher pain intensity ratings for all anatomical regions except the upper extremity, and with lower function scores for all anatomical regions. In the multiple regression models that controlled for potential confounding factors (age, sex, and duration of symptoms), fear-avoidance beliefs were the strongest contributor to pain intensity ratings for each anatomical region.

Fear-avoidance beliefs and pain intensity were the 2 strongest contributors to function scores for each region, indicating that fear-avoidance adversely impacts function, even after controlling for pain intensity¹². Impact of impaired functional balance and increased fears and beliefs of Knee OA on quality of life was not analysed in the present study. K. Sabashi et al found that impaired dynamic balance (FRT) was associated with low QOL in patients with OA knee¹³.

The fear-avoidance factors are significant from the perspective of the analysis of postural stability in subjects with knee and/or hip OA⁵. Measuring fears and beliefs in patients with knee OA may help in developing treatment approaches such as education and behavioural therapy and better define prognosis at the individual level. Pain-related fear have something additional to offer above and beyond what might be explained by traditional disease-related factors. Clinicians interested in understanding variations in adjustment to knee OA pain might benefit by expanding the focus of their inquiries beyond traditional demographic and medical status variables to include an assessment of pain catastrophizing and pain-related fear⁶.

The limitation of the study is that regression analysis of confounding factors was not done. The future studies should aim at considering the confounding factors affecting both fears and beliefs and functional balance in patients with knee OA. Management of fears and beliefs should be included along with conventional treatment for OA knee.

Conclusion: Fears and beliefs about knee osteoarthritis were present among patients and reduced functional balance. No correlation was found between balance and fear and beliefs in the present study. Weak negative correlation was found between pain and balance and pain and fears and beliefs about knee osteoarthritis.

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