

PREVALENCE OF KINESIOPHOBIA AMONG COMMUNITY-DWELLING INDIVIDUALS WITH KNEE PAIN: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Knee pain is a common and debilitating condition, particularly among older adults, and is often associated with degenerative diseases such as osteoarthritis. Alongside physical impairment, psychological factors such as kinesiophobia (fear of movement) play a crucial role in the persistence and exacerbation of pain.

Aims & Objectives: The primary aim of this study was to assess the prevalence of kinesiophobia using the Tampa Scale for Kinesiophobia (TSK) in individuals with knee pain. A secondary objective was to examine the relationship between BMI and kinesiophobia severity.

Materials & Methodology: A cross-sectional study was conducted with 81 participants aged 40-80 years with knee pain, selected through convenience sampling in Surat city. Participants were assessed using the TSK (Gujarati version), and BMI was categorized according to the World Health Organization (WHO) classification. Descriptive and inferential statistics were performed using Microsoft Excel 2016.

Results: Out of 81 participants, 44 individuals (54%) had a TSK score greater than 37, indicating high levels of kinesiophobia. The mean TSK score for this group was 39.79 ± 3.93 . No significant difference in kinesiophobia severity was observed between the BMI categories ($p = 0.33$).

Conclusion: The study highlights the high prevalence of kinesiophobia in individuals with knee pain. Incorporating psychological assessments like the TSK into routine evaluations can help identify individuals at risk and guide more holistic treatment approaches to improve outcomes in knee pain rehabilitation.

Keywords: Knee pain, Kinesiophobia, BMI, Rehabilitation.

INTRODUCTION

Knee pain is a prevalent and debilitating condition that affects a significant portion of the population, particularly in older adults. It is often associated with progressive joint degeneration and results in long-term disability, reduced quality of life, and diminished ability to perform daily tasks. Knee pain encompasses a spectrum of disorders with overlapping etiologies but common clinical

outcomes, leading to symptoms such as pain, swelling, reduced range of motion, crepitus, stiffness, and joint instability. The burden of knee pain is particularly evident in functional activities such as stair climbing, walking, rising from a seated position, and other activities of daily living, where patients experience limitations and increased dependency on others.¹

The condition typically begins with activity-induced pain, often exacerbated after periods of inactivity or upon resuming motion after rest. As the condition progresses, pain may become persistent, even during periods of rest, severely affecting both physical and psychological well-being. While the severity of pain and physical impairment are key predictors of functional limitations, the influence of psychological factors, particularly fear and anxiety related to movement, has gained increasing recognition in the pathophysiology of chronic knee pain.²

Kinesiophobia, or the fear of movement, is a significant psychological factor that contributes to the chronicity and exacerbation of knee pain. This irrational fear is often based on the anticipation of pain, injury, or re-injury during physical activity, leading individuals to avoid movement altogether.

This avoidance behavior further contributes to muscle weakness, joint instability, and increased physical deconditioning, thereby perpetuating the cycle of pain and disability. This psychological barrier, often accompanied by pain catastrophizing—an exaggerated negative emotional response to anticipated pain—can impair an individual's engagement in rehabilitation exercises and daily activities, hindering recovery and functional improvement.^{3,4}

Muscle strength, particularly in the quadriceps, plays a critical role in managing knee pain and preventing the progression of structural damage in the joint. Weakness in the surrounding muscles not only increases the risk of injury but can also lead to feelings of instability, further heightening the fear of movement. Regular physical activity has been shown to improve muscle strength and reduce the perception of knee instability, thereby enhancing mobility and function. However, individuals with kinesiophobia are less likely to engage in these beneficial activities, creating a vicious cycle that contributes to both the physical and psychological deterioration of the knee joint.⁵

The Tampa Scale for Kinesiophobia (TSK) is a widely used, validated tool to assess the level of fear related to movement and physical activity in individuals with musculoskeletal disorders. It has been particularly useful in evaluating the fear-avoidance behaviors seen in patients with chronic pain conditions, including knee osteoarthritis and post-injury recovery.⁶ The present study targeted to

explore the prevalence of kinesiophobia among community-dwelling individuals with knee pain, emphasizing the importance of psychological factors in the management and rehabilitation of knee pain. Understanding the role of kinesiophobia and pain-related fear can help in designing more effective, holistic treatment plans that address both the physical and psychological aspects of knee pain management.

AIM & OBJECTIVES

The aim of the present study was to evaluate the prevalence of kinesiophobia among community-dwelling individuals with knee pain residing in Surat city, Gujarat.

The primary objective of the study was to assess the severity of kinesiophobia in individuals with knee pain using the Tampa Scale of Kinesiophobia (TSK). The secondary objective was to examine the relationship between Body Mass Index (BMI) and the level of kinesiophobia in community-dwelling individuals with knee pain.

MATERIALS AND METHODOLOGY

A cross-sectional survey study was conducted among community-dwelling individuals aged 40 to 80 years, residing in various areas of Surat city, who were experiencing knee pain. A total of 81 subjects were selected using a convenient sampling method who meet below mention Inclusion and Exclusion criteria and willing to participate in study.

Inclusion Criteria: Age between 40-80 years, Both male and female participants, Individuals with knee joint pain and Willing to participate in the study.

Exclusion Criteria: Individuals with a history of knee replacement surgery, recent knee trauma or any other type of knee surgery, Individuals diagnosed with gout, rheumatoid arthritis, or ankylosing spondylitis or with known neurological disorders that may affect balance.

Sample size was calculated using formula $n = Z^2 \cdot p \cdot (1-p) / d^2 = 93$

Where:

n = required sample size

Z = Z-score for desired confidence level (e.g., 1.96 for 95% confidence)

p = estimated prevalence or proportion (60%)⁹

d = desired precision or margin of error (10% = 0.10)

The required sample size was calculated to be 93 based on an expected prevalence of 60%, a 95%

confidence level, and a 10% margin of error. However, due to limitations in population availability and recruitment feasibility, only 81 participants were included in the study.

Demographic data, including name, age, sex, educational qualification, duration of knee pain, and the history of other medical conditions, were collected for each participant. All participants were provided with a clear explanation of the study. Written informed consent was obtained prior to the commencement of the study.

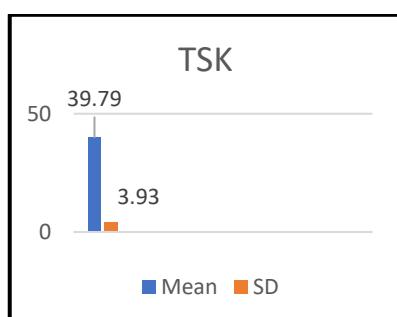
The Tampa Scale for Kinesiophobia (TSK) (Gujarati Version) was used to assess the level of kinesiophobia in the participants. The TSK consists of 17 items, with scores ranging from 17 to 68. A score of 17 indicates no kinesiophobia, while a score of 68 indicates extreme fear of pain with movement.

Based on Vlaeyen et al.'s 1995 study, a score of 37 or higher was used as the cutoff for identifying high levels of kinesiophobia, with scores below 37 considered as low levels of kinesiophobia.³ The Gujarati version of the TSK demonstrates Good reliability (Cronbach's $\alpha > 0.7$, ICC > 0.8) and Strong validity (supported by expert review and correlational analysis) makes it suitable for use in research settings involving Gujarati-speaking patients with musculoskeletal or chronic pain conditions.

STATISTICAL ANALYSIS AND RESULTS

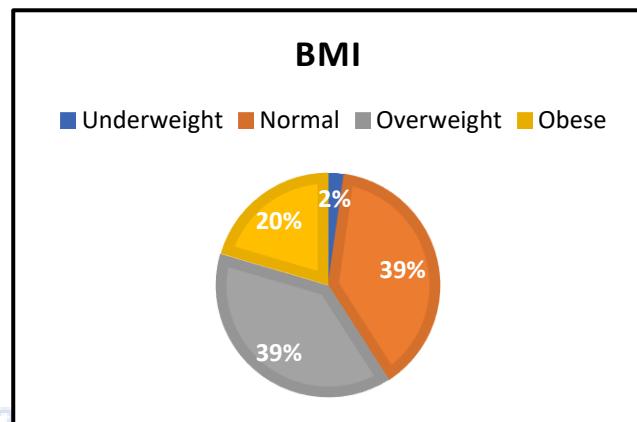
The statistical analysis for this study was performed using Microsoft Excel 2016. Descriptive statistics, including the mean and standard deviation (SD), were calculated for all 81 participants using the AVERAGE and STDEV functions in Excel.

Out of 81 participants, 44 individuals had a Tampa Scale for Kinesiophobia (TSK) score greater than 37, indicating a prevalence of 54%. The mean TSK score for these 44 individuals was 39.79 ± 3.93 (Graph 1).



GRAPH 1: MEAN AND SD OF TSK SCORE

Participants were categorized into four groups based on their Body Mass Index (BMI), following the World Health Organization (WHO) classification. The four categories included: Underweight ($<18.5 \text{ kg/m}^2$), Normal weight ($18.5 - 24.9 \text{ kg/m}^2$), Overweight ($25 - 29.9 \text{ kg/m}^2$) and Obese class ($>30 \text{ kg/m}^2$). The percentage of participants in each BMI category is shown in Graph 2.



GRAPH 2: PERCENTAGE OF PARTICIPANTS INTO EACH CATEGORY OF BMI.

Mean and SD of TSK scores for each BMI category were calculated and are displayed in Table 1.

TABLE 1 DISTRIBUTION OF TSK SCORES BY BMI CATEGORIES

BMI	NO. OF PARTICIPANT	MEAN	SD
UNDERWEIGHT	1	44	0
NORMAL	17	39.14	5.75
OVERWEIGHT	17	40.82	17.27
OBSE CLASS	9	38.66	24.5

Anova single factor test for TSK scale which was performed for between groups comparison shows Sum of squares (SS) is 40.048, Degree of freedom(df) is 3, Mean square (MS) is 16.34, F is value which is dividing two mean square is 1.15, P is the probability of F value is p=0.33 and F crit is 2.83.

The p-value of 0.33 indicates that there was no statistically significant difference in TSK scores between the different BMI categories.

DISCUSSION

Knee pain is a multifactorial condition commonly associated with degenerative changes such as articular cartilage deterioration, subchondral

sclerosis, and osteophyte formation.⁷ It leads to joint stiffness, functional impairment, and restrictions in daily activities. Chronic knee pain, as seen in osteoarthritis or post-traumatic cases, often results in sensitization phenomena due to prolonged nociceptive stimulation and neuroplastic changes.⁸

In chronic musculoskeletal conditions like knee osteoarthritis (OA), the transition from acute to chronic pain is not solely due to peripheral mechanisms but also influenced significantly by psychological and behavioral factors. Among these, kinesiophobia, or fear of movement due to anticipated pain or reinjury, plays a pivotal role.⁴ It often contributes to hypervigilance, reduced physical activity, and avoidance behaviors that perpetuate the pain cycle and further deteriorate functional capacity.³

Evidence suggests a high prevalence of kinesiophobia among individuals with knee pain. In the Indian context, studies report that 50% to 75% of adults with knee OA experience significant kinesiophobia, with one Gujarat-based study identifying TSK scores >37 in over 60% of participants.⁹ Similarly, in post-traumatic conditions such as ACL reconstruction, up to 70% of patients report kinesiophobia, particularly during return-to-sport phases.¹⁰ These data underscore the ubiquity of pain-related fear in various etiologies of knee pain. Further, sex-based differences in kinesiophobia have been noted. A study on chronic musculoskeletal pain found higher levels of kinesiophobia in men (72%) compared to women (48%), suggesting possible gender-specific pain coping strategies and psychosocial dynamics that warrant further investigation.¹¹

This current study identified the presence of kinesiophobia in more than half of the studied population (54% prevalence) align with previous literature indicating that individuals with persistent knee pain exhibit high rates of kinesiophobia, contributing to prolonged disability and altered pain thresholds. Additionally, when comparing kinesiophobia across different Body Mass Index (BMI) categories, no statistically significant difference was observed in the severity of kinesiophobia among individuals categorized as underweight, normal weight, overweight, or obese ($p = 0.33$). While the mean TSK scores varied slightly across these BMI groups, the lack of statistical significance suggests that BMI may not be

a direct influencing factor for the presence or severity of kinesiophobia in this population.

Importantly, the presence of kinesiophobia is not just a psychological concern—it has tangible physiological implications. The structural and physiological changes due to kinesiophobia include quadriceps atrophy, joint stiffness, altered gait, and proprioceptive deficits^{12,14,15}. Reduced mechanical loading on the knee impairs synovial fluid distribution and cartilage nutrition, accelerating degenerative changes^{12,14}. Inactivity also contributes to decreased joint range of motion and increased connective tissue stiffness.

Neuroplastic changes in the central nervous system due to chronic pain and fear further amplify pain perception and disability^{11,16}. These factors collectively impair function, reduce quality of life, and increase fall risk in this population^{13,17}.

Given these insights, it is essential that clinical management of knee pain integrates psychological assessment and interventions. Addressing kinesiophobia through cognitive behavioral therapy (CBT), graded exposure, and patient education can improve treatment outcomes.¹⁸ Tailored rehabilitation programs that consider both physical and psychological dimensions may break the vicious cycle of pain, avoidance, and dysfunction.

CONCLUSION

This study identified a 54% prevalence of kinesiophobia among community-dwelling individuals with knee pain, highlighting a significant psychological barrier to functional recovery. From a clinical perspective, these findings underline the importance of incorporating psychological screening tools, such as the Tampa Scale for

Kinesiophobia (TSK), in routine assessments. Early identification of fear-avoidance beliefs can inform targeted interventions aimed at improving adherence to rehabilitation, reducing disability, and enhancing quality of life.

The clinical significance of this study lies in its potential to shift rehabilitation paradigms from purely biomechanical approaches to a biopsychosocial model, ensuring more comprehensive and individualized care for patients with chronic knee pain in community settings.

LIMITATION

The primary limitation of this study is the smaller sample size than initially calculated. This may reduce the statistical power and generalizability of the findings. Future studies with larger and more representative samples are recommended.

FUTURE RECOMMENDATION

Future studies with larger sample sizes and further exploration of psychological and physical factors may help refine treatment strategies for individuals suffering from knee pain.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this study.

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