

## Research article

**Prevalence of anxiety among patients with a total knee replacement**

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Corresponding author: **Vignesh Srinivasan**. Email: vigneshphysio1989@gmail.com**ABSTRACT**

**Introduction and Aim:** Knee pain mainly attributed to osteoarthritis in the elderly, significantly impacts daily life. Non-surgical options include analgesics and physical therapy, but Total Knee Replacement (TKR) is most effective for severe cases. While complications are generally minimal, infections and psychological distress may arise. Studies indicate improved mental well-being post-TKR due to pain relief. The aim is to determine the prevalence of anxiety among patients with Total Knee Replacement.

**Methods and Materials:** 100 participants, aged 45-84, comprising both genders, were selected through convenient sampling. Informed consent was obtained, and assessments were conducted using the Hamilton Anxiety Rating Scale (HAM-A) over 8 weeks at SMCH. The researcher collected sociodemographic details, including name, age, height, weight, and comorbidities. The HAM-A, consisting of 14 items graded from 0 to 4, measured anxiety levels. Total scores ranged from 0-56, indicating mild to severe anxiety. The study aimed to understand anxiety prevalence among TKR patients, employing a comprehensive approach to gather and analyze data within a specified time.

**Results:** The statistical analysis revealed among 100 patients with a total knee replacement, between the age of 45-84 years, the prevalence of anxiety is widespread.

**Conclusion:** Post total knee replacement, widespread anxiety necessitates coordinated intervention from surgeons, physical therapists, and psychotherapists within hospital management to effectively address associated complications.

**Keywords:** Knee joint; osteoarthritis; knee pain; anxiety; total knee replacement (TKR); Hamilton anxiety scale.

**INTRODUCTION**

One must first be able to comprehend the intricate anatomy and physiology of the knee joint in order to comprehend the issues related to the joint. The tibiofemoral joint and the patellofemoral joint are essentially the two joints that make up the knee joint. Some of the most crucial functional components of the knee joint include the ligaments, muscles, bursa, and menisci, which are in charge of the various movements the knee joint makes both during normal use and under stress. As the joint of the lower extremities, the knee is constantly stressed as a result of activity and gravitational forces. So as to maintain stability while maintaining mobility, it demands a balanced quantity of effective functioning from both the muscles and ligaments (1).

The knee joint, which serves as the primary motor joint of the lower limb, is one of the most delicate joints in the human body. This joint's dysfunction can have a direct or indirect impact on a person's ability to function and mental health. It is crucial to comprehend the biomechanics, anatomy, and physiology of both the healthy knee joint complex and the sick knee joint complex. In the general population, and especially the elderly population, chronic knee pain and dysfunction are fairly common. Osteoarthritis (OA) is among the most often occurring reasons for persistent knee discomfort. Numerous non-surgical treatments, including physiotherapy, self-management courses,

and pharmaceuticals, are available to address persistent knee pain. Studies indicate that these have relatively little impact on knee discomfort, nevertheless. Some surgical procedures include osteotomy and arthroscopy; however, their success rates are also constrained. The only treatment with a high success rate for treating persistent knee pain is total knee replacement (TKR). According to numerous research and evaluations, TKR is a very effective, end-stage surgical surgery. It is a very efficient way to treat chronic knee pain and the resulting dysfunctions (2).

It has been noted during the last few years that the significance of a medical procedure's outcome has grown. Goals and anticipated outcomes for orthopaedic treatment differ from patient to patient based on age, sex, diagnosis, and lifestyle. It has been demonstrated that patient expectations significantly affect the postoperative prognosis, especially in the context of total knee replacement. The primary objectives of operations like TKR are pain alleviation and the restoration of joint function; therefore, patient goals and outcomes vary depending on the kinds of activities they will be engaging in the following surgery. In the past, orthopaedic surgery outcomes were assessed by specialists using a well-recognized functional assessment, resulting in the development of standard instruments to measure outcomes. The hospital invented some of the most well-liked tools for assessing patients' post-operative pain and function.

These measures, however, have been created to be physician-driven and solely assess knee function in respect to the patient's gait and stairs climbing ability.

They do not take into account activities that are more important to each patient's functional and recreational needs, actions that put the lower extremities under more biomechanical stress, or activities that are performed in a more natural way (kneeling and carrying loads) (3).

TKR is a major surgical treatment that is often done on elderly patients; therefore, it is prone to both immediate and delayed consequences. Even though the failure rate may be minimal, it might nonetheless put a significant strain on the healthcare system. One of the main issues that are seen in patients after major surgery is death. The mortality rate for TKR has been dropping as hospital stays have gotten longer. According to studies, men post-surgery had a greater mortality rate than women. The majority of the issues were general in nature and not directly connected to the procedure. Hematomas or seromas were the most frequent complications associated with wounds. In a population-based study, 4.9% of patients were diagnosed with a pulmonary embolism, also referred to as deep vein thrombosis, or thromboembolic event, and 6.7% of patients had an experience of myocardial infarction, or cardiac arrhythmia, in the 90 days following surgery. A study found that the most frequent reasons for readmission to the hospital following total knee replacement (TKR) were limited motion (18.2%), wound problems (14%), surgical site infections (9.9%), bleeding (9.9%), and venous thromboembolism (3.3%).

Periprosthetic infection is one of the most feared TKR side effects. This infection is present in between 0.4 and 2.0% of people. Most frequently, *Staphylococcus aureus* and *Staphylococcus epidermidis* cause this infection. Swelling, erythema, and prolonged discharge are signs of acute infections that last for around 5-7 days after surgery. In most cases, these severe infections appear two months after the operation. Late infections become obvious more than two years after surgery, while intermediate infections typically appear two months to two years following surgery. Patients with these infections experience unpleasant symptoms. a painful, swollen, and stiff joint (4).

It has been found that psychological symptoms like anxiety and depression are more common in individuals, particularly older people with chronic end-stage hip or knee OA. Psychological symptoms have a detrimental effect on the effectiveness of treatment and the rate of improvement. It has a detrimental effect on the patient's motivation, vitality, and adherence to the prescribed treatment plan. As a result, psychological disorders including sadness and anxiety play a significant role in people who have had TKR surgery. Anxiety is more common in end-stage

patients, according to previous studies, and it has been noticed that symptoms are eased by lowering pain and dysfunction levels in such patients (5). The aim of the present study is to determine the prevalence of anxiety among patients with Total Knee Replacement.

## **MATERIALS AND METHODS**

### **Participants and selection criteria**

Based on the inclusion and exclusion criteria, a convenient sample strategy was used to choose participants for the observational study. Both male and female volunteers participated in this study, which comprised patients who had undergone TKR surgery.

Patients with severe pain, hypersensitivity, psychological instability, post-operative complications, were excluded. The Saveetha Physiotherapy OPD at Saveetha Medical College and Hospital in Thandalam, Chennai, was used as the study site. Before the procedure started, the patients submitted their informed consent and received a thorough explanation of the process. The patients were evaluated, and the frequency of anxiety in them was determined, using the Hamilton Anxiety Rating scale.

### **Procedure**

Using a practical sampling technique, 100 samples—100 male and 100 female—in the 45–84 age range were chosen for this investigation based on inclusion and exclusion criteria. Every participant gave their informed consent after being fully informed about the study's purpose. The samples were studied for two months during the investigation, which was carried out in SMCH. The researcher collected the sociodemographic information, which included name, age, height, weight, and any related comorbidities.

The 14 items that collectively make up the Hamilton Anxiety Rating scale are each characterized by a set of symptoms that indicate the degree and nature of anxiety. Every item receives a score ranging from 0 (not present) to 4 (severe). The scale's overall score range is 0-56, with a score of less than 17 denoting mild severity, a score of 18–24 mild to moderate severity, and a score of 25–30 moderate to severe. Among the chosen samples, the researcher asked and completed a total of 14 items.

### **Inclusion criteria**

- People between the age group of 45-84.
- Both males and females with a total knee replacement.
- TKR patients with anxiety and depression.

### **Exclusion criteria**

- Postoperative TKR complications.
- Hypersensitive patients.
- Patients with severe psychological instability.
- Patients unable to respond and react.
- Patients with severe knee joint pain.

**Outcome measure**

**Hamilton anxiety rating scale (HAM-A)**

One of the earliest rating scales created to assess the intensity of anxiety symptoms was the HAM-A, which is still in use today. Each of the 14 items on the scale is characterized by a set of symptoms. It gauges anxiety on both a bodily and psychological level.

A total score range of 0-56 is assigned to each item, with a range of 0 (not present) to 4 (severe). A score of less than 17 denotes light severity, 18–24 mild to moderate severity, and 25–30 moderate to severe. Table 2 mentions the outcome measure scale (6).

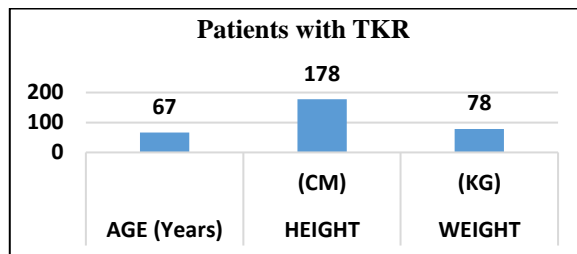
**Statistical analysis**

After carrying out a descriptive analysis, the subject's mean age, height, and weight were determined. The data gathered from the questionnaire was used to quantify the proportion of anxiety prevalence among patients with a TKR.

**RESULTS**

The study spanned an 8-week period, encompassing initial and final assessments of Total Knee Replacement (TKR) patients.

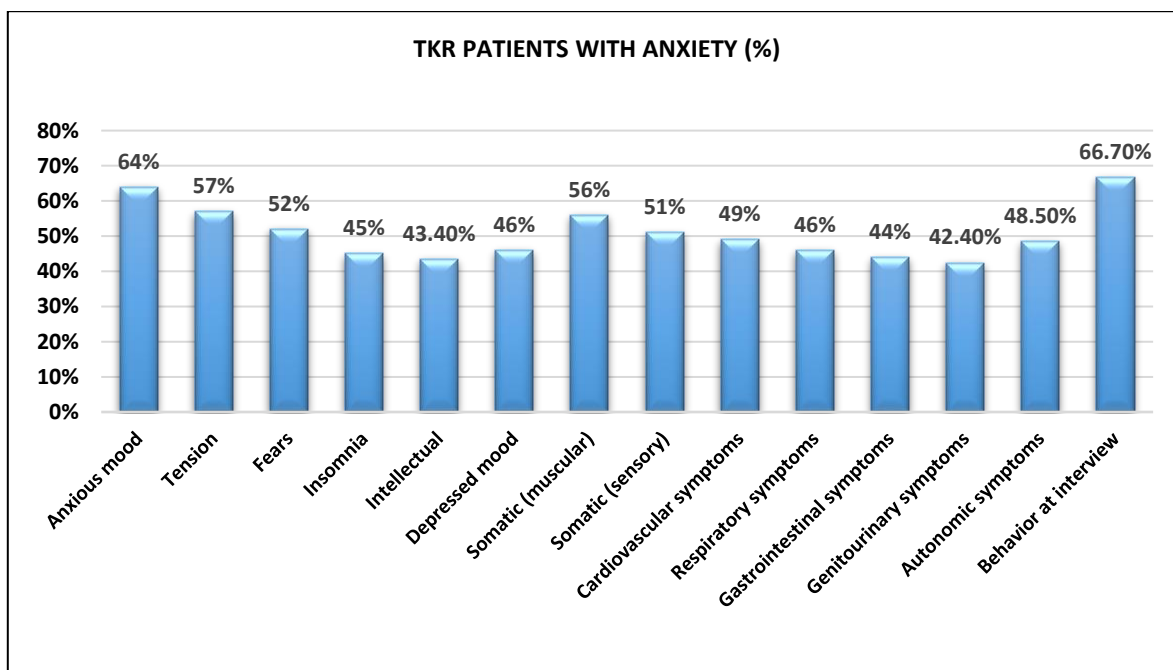
Notably, females emerged as the predominantly affected gender in this cohort. Analysing socio-demographic data, the average age of TKR patients was determined to be 67, with an average height of 178 cm and an average weight of 79 kg which is mentioned in Fig. 1.



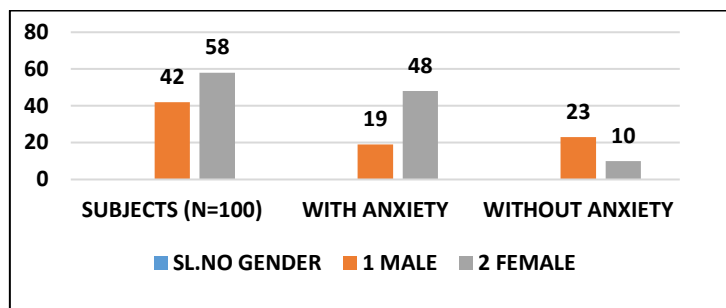
**Fig. 1:** Socio-demographic data

Utilizing the Hamilton Anxiety Rating Scale, the investigation identified specific psychological challenges among TKR patients. As mentioned in Fig. 2, this included anxious mood, fear of falling, insomnia, and muscular and somatic disturbances. The statistical analysis of 100 TKR patients (aged 45-84) revealed a gender-specific disparity in anxiety and depression prevalence, with 28.35% of males and 71.64% of females experiencing these psychological issues post-TKR. These findings highlight the multifaceted impact of TKR on patients, extending beyond physical considerations to encompass mental health aspects.

In Fig. 3, the observed gender difference in anxiety and depression rates underscores the importance of tailored interventions and support for TKR patients, acknowledging the unique challenges faced by both male and female individuals undergoing this surgical procedure. The detailed examination of socio-demographic and psychological factors contributes to a nuanced understanding of the holistic implications of TKR on patients' well-being.



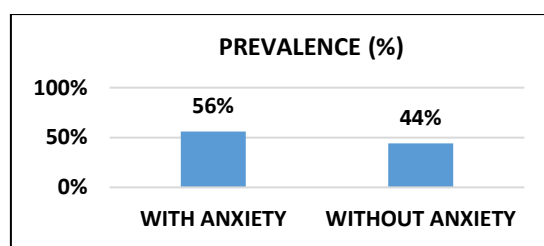
**Fig. 2:** Prevalence of anxiety in patients with a total knee replacement using the Hamilton anxiety rating scale (HAM-A)



**Fig. 3:** Prevalence of anxiety among male and female patients with a total knee replacement by using the Hamilton anxiety rating scale (HAM-A)

**Table 1:** Prevalence of anxiety in different age groups (45-84) among total knee replacement patients by using the Hamilton anxiety rating scale (HAM-A)

Sl. No	Age in years	Subjects (N=100)	Subjects with anxiety (56)	Subjects without anxiety (44)
1	45-50	11	2(3.57%)	9(20.45%)
2	51-56	8	3(5.35%)	5(11.36%)
3	57-61	10	8(14.25%)	2(4.54%)
4	62-67	13	3(5.35%)	10(22.72%)
5	68-72	31	20(35.71%)	11(25%)
6	73-78	17	15(26.78%)	2(4.54%)
7	79-84	10	6 (10.71%)	4(9.09%)



**Fig. 4:** Prevalence of anxiety in different age groups (45-84) among total knee replacement patients by using the Hamilton anxiety rating scale (HAM-A)

The study also mentions that using the HAM scale, it was observed that the prevalence of anxiety is most seen in the age group of 45-84 years which is mentioned in Table 1. Therefore, after the complete keen observation and assessment, it is observed in Fig. 4 that in a population of 100 subjects, 56% subjects were observed undergoing anxiety which clearly states the prevalence of anxiety in patients with a TKR.

### DISCUSSION

This study was performed to find out the prevalence of anxiety among patients with a total knee replacement. The knee joint is one of the most delicate motor joints of the human body. It is one of the primary motor joints of the lower limb. Since this joint has a major role in stability and locomotion, dysfunction in this joint can cause both physical and mental health impacts on an individual. To understand the dysfunctions of the knee joint, one must be able to comprehend the biomechanical, physiological, and anatomical aspects of the joint. Knee joint pain is one of the most common joint

pains that occur in individuals, especially the elderly population (7).

Osteoarthritis (OA) is among the most often occurring reasons for persistent knee discomfort. Numerous non-surgical treatments, including physiotherapy, self-management courses, and pharmaceuticals, are available to address persistent knee pain. Some surgical procedures include osteotomy and arthroscopy; however, their success rates are also constrained. The only treatment with a high success rate for treating persistent knee pain is total knee replacement (TKR). According to numerous research and evaluations, TKR is a very effective, end-stage surgical surgery. It is a very efficient way to treat chronic knee pain and the resulting dysfunctions (8).

Carr in his study suggested that one of the most common surgeries is knee replacement surgery. Patients with advanced arthritis or OA are most frequently treated with it. Patients over the age of 45 to 55 are increasingly thinking about replacement surgery. To evaluate the results of the surgery, a pre-

and post-operative assessment should always be carried out (9).

In their study, Craske and Stein hypothesized that anxiety and depression may be exacerbated or caused by chronic pain, creating a vicious cycle that may have a significant effect on the course and treatment of numerous chronic illnesses (10). The relationship between knee conditions, Total Knee Replacement, and anxiety has been studied in several studies.

Determining whether preoperative anxiety and depression are the cause or effect of knee pain is a challenge when reviewing TKA results. This study demonstrates that knee pain contributes to psychological symptoms and that a successful total knee arthroplasty (TKA) offers a good probability of alleviating both anxiety and depression, as both symptoms improve with knee pain and function (11).

It is also stated in many studies that poor mental health is a crucial predictor of post-operative dissatisfaction in TKR patients. It is usually due to persistent knee pain and the inability to perform normal functional activities. Anxiety is very prevalent in patients after TKR surgery as there are higher chances of disbalance and falling. As a result, it is evident that anxiety is quite prevalent and that more research is required to determine the precise causes of the other components contributing to anxiety after TKR. In this manner, it would make the medical staff's care for these patients more approachable (12).

## **CONCLUSION**

It has been determined from the present study that subjects with a total knee replacement have a high prevalence of anxiety among them.

## **ACKNOWLEDGEMENT**

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## **CONFLICT OF INTEREST**

The authors declare no conflicts of interest.

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