

# Retro-Pro prospective, Observational Study to Assess the Functional Ability in Patients Who Underwent Total Knee Arthroplasty for Osteoarthritis

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## Abstract:-

### ➤ Background

Osteoarthritis is the most common joint disease in India, affecting 22% to 39% of the population. Compared to men, women are more prone to have OA, and as they age, this prevalence increases dramatically. In terms of nonfatal burden, OA was ranked as the tenth most common cause. Osteoarthritis is believed to be brought on by mechanical stress on the joint and low-grade inflammatory processes. Given the prevalence of knee arthritis, total knee arthroplasty (TKA) is one of the most common orthopaedic surgeries carried out globally. We evaluated the patients' functional recovery and result following total knee arthroplasty, taking into account their range of motion, independence in climbing stairs, and ability to kneel.

### ➤ Methods

Evaluation of post-TKA patients' functional abilities using the Insall Knee Score, Oxford Knee Score, range of motion, and independent stair climbing ability in patients with osteoarthritis who had TKA. 46 patients, ages 45 to 80 years, of both sexes, were brought to the Annapoorana Medical College Hospital in Salem with advanced osteoarthritis in their knee joints; these individuals had total knee arthroplasty as treatment. This observational study is retro-prospective and was conducted from May 2021 to October 2023, with a follow-up period of two years.

### ➤ Results

After a total knee replacement for osteoarthritis, the patient's functional status significantly improves, with the capacity to carry out everyday tasks being the ultimate objective. This dissertation validates it once more. We find that during the one-year post-operative follow-up period, there was a significant improvement in the functional outcome indicated by the Insall knee score, range of motion, and capacity to climb stairs independently. Nevertheless, the patient's ability to kneel was not observed to have improved. Despite their simplicity, knee movements are involved in a wide range of complex

circumstances, each of which needs its own independent study. This could contribute to improved knee arthroplasty patient prognosis.

**Keywords:-** Osteoarthritis, Total Knee Arthroplasty(TKA), Insall Knee Score, Kneeling.

## I. INTRODUCTION

With a prevalence of 22% to 39% in India, osteoarthritis is the most common joint disease and the second most common rheumatologic disorder. Women are more likely than males to have OA, and the frequency rises sharply with age. OA was estimated to be the 10th leading cause of nonfatal burden<sup>1</sup>. Due to the prevalence of knee arthritis, total knee arthroplasty (TKA) is one of the most common orthopaedic procedures carried out globally. The knee is the joint most commonly affected by osteoarthritis (OA). Following total knee arthroscopy (TKA), standard rehabilitation regimens often emphasize range of motion, stretching, strengthening, and endurance exercises<sup>2</sup>. Kneeling is a crucial functional action that impacts one's capacity to perform daily activities like cleaning, child play, and gardening<sup>3</sup>.

We have evaluated the patients' functional recovery and result following total knee arthroplasty, both subjectively and objectively<sup>4,5,6</sup>. This covers the patients' range of motion, their capacity of climbing stairs on their own, and their ability to kneel.

### ➤ Aims and Objectives

Function assessment in post-TKA patients using the Insall Knee Score, Oxford Knee Score, range of motion, and independent stair climbing abilities in patients with osteoarthritis who had TKA.

## II. METHODS

- Study area – Annapoorana medical college and hospital, Salem
- Study population – 46 in number, 45 to 80 years of both sexes with advanced osteoarthritis
- Design and duration – Retro-prospective observational

study and may 2021 – October 2023

❖ *Exclusion Criteria*

Age <45 years and > 80 years, rheumatoid arthritis with advanced deformity and other causes of secondary osteoarthritis, refusal to consent.

❖ *Follow Up*

At 3 months, 6 months and 12 months using measurement of range of motion, oxford knee score for kneeling ability and insall knee score.

**III. RESULTS**

Regarding the patients' fundamental demographics, the average age was 66.4 years. 14 (30.4%) were males and the remaining 32 (69.6%) were females.

**TABLE 1 - ASSOCIATION OF AGE AND SEX**

AGE (Yrs)	MALE		FEMALE		p value
	N	%	N	%	
<b>51-60</b>	2	14.3%	8	25.0%	<b>0.327</b>
<b>61-70</b>	6	42.9%	17	53.1%	
<b>71-80</b>	6	42.9%	7	21.9%	
<b>Total</b>	<b>14</b>	<b>100.0%</b>	<b>32</b>	<b>100.0%</b>	

Twenty patients (43.5%) had surgery on their right knee, while 26 patients (56.5%) had surgery on their left knee. Based on BMI, 4 (8.7%) patients belonged to the group < 23, while 4 (8.7%) patients were in the 23–25 group. In the group of 25–30, there were 17 (37.0%). There were 21 patients (45.7%) in the final group of more than thirty.

**TABLE 2 - DISTRIBUTION OF CASES ACCORDING TO BMI**

BMI (kg/m2)	N	%
<b>&lt;23</b>	4	<b>8.7</b>
<b>23-25</b>	4	<b>8.7</b>
<b>25-30</b>	17	<b>37</b>
<b>&gt;30</b>	21	<b>45.7</b>
<b>Total</b>	<b>46</b>	<b>100</b>

Our study revealed that, out of 46 cases, 25 (54.3%) had a depressed joint line, 18 (39.1%) had a restored joint line, and 3 (6.5%) had an elevated joint line.

**TABLE 3 - DISTRIBUTION OF CASES ACCORDING TO JOINT LINE**

JOINT LINE	N	%
<b>ELEVATED</b>	3	<b>6.5</b>
<b>RESTORED</b>	18	<b>39.1</b>
<b>DEPRESSED</b>	25	<b>54.3</b>
<b>Total</b>	<b>46</b>	<b>100</b>

Our study's findings regarding independent stair climbing by follow-up time are listed in the table below.

INDEPENDENT STAIRS CLIMBING	NO		WITH SUPPORT		YES		P value (compared to 3 months)
	N	%	N	%	N	%	
<b>3 MONTHS</b>	4	8.7	18	39.1	24	52.2	-
<b>6 MONTHS</b>	2	4.3	2	4.3	42	91.3	<0.001*
<b>12 MONTHS</b>	2	4.3	2	4.3	42	91.3	<0.001*

Our study indicates that the pre-operative Insall Knee score was 40.9±11.5. After three months, it improved to 75.1±2.7; after six months, it improved to 82±3.3; and after a year, it improved to 95.8±2.5.

**TABLE 15- MEAN INSALL KNEE SCORE BY BMI**

Insall Knee Score	BMI (kg/m <sup>2</sup> )				p value
	<23	23-25	25-30	>30	
<b>PRE-OP</b>	34.9±10.1	31.3±14.5	46.7±10.4	39.3±10.5	<b>0.029*</b>
<b>3 MONTHS</b>	74.8±2.8	74.8±2.8	75.1±2.7	75.2±2.8	<b>0.98</b>
<b>6 MONTHS</b>	83.8±2.1	80.5±4.8	82.7±2.8	81.3±3.5	<b>0.328</b>
<b>12 MONTHS</b>	<b>95.5±2.6</b>	<b>96.5±3.8</b>	<b>95.5±2.3</b>	<b>96±2.4</b>	<b>0.867</b>

Across our study period it was found that none of our patients were able to kneel down at the end of differing follow up times at 3 months, 6 months and 12 months.

**IV. DISCUSSION**

Between May 2021 and October 2023, 46 cases were evaluated in the orthopaedic surgery department of Annapoorana Medical College and Hospital in Salem. The post-operative range of motion, independent stairs climbing ability, and kneeling ability were assessed for each of these patients who had a primary total knee replacement. The functional capacities of the knee were evaluated using the Insall modification Knee Score and the Oxford Knee score.

The study's subjects were primarily female (69.6%), with ages ranging from 51 to 80 years old. The body mass index was 29.5 on average. Surgery was performed on the left knee more frequently (56.5%). Our research revealed improvements in range of motion and the Insall Knee Score following total knee arthroplasty (TKI), with the greatest improvement observed within the first three months. The capacity to climb stairs can also be used to evaluate functional assessment<sup>7</sup>. At the end of a 12-month period, 92% of our patients had no

trouble climbing stairs, according to our study. None of our patients was able to kneel down.

By the time our trial came to a conclude, most of our patients had completely recovered from their symptoms, and TKA had improved their mobility.

**V. CONCLUSION**

After a total knee replacement for osteoarthritis, the patient's functional status significantly improves, with the capacity to carry out day to day activities being the ultimate objective<sup>8,9</sup>. This study validates it once more. We observe that during the one-year post-operative follow-up period, there was a significant improvement in the functional outcome confirmed by the Insall knee score, range of motion, and capacity to climb stairs independently. Nevertheless, the patient's ability to kneel was not observed to have improved. Despite their simplicity, knee movements are involved in a wide range of complex circumstances, each of which needs its own independent study<sup>10,11</sup>. This could contribute to improved knee arthroplasty patient prognosis.

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