



# Patient-reported short to medium term functional outcome following Total Knee Replacement: An Oxford Knee Score-based observational study in a tertiary care hospital

Chockalingam. S<sup>1</sup>, Chandru B<sup>2\*</sup>, Ramasamy. P. R<sup>3</sup>

<sup>1</sup>Senior Consultant Orthopaedic Surgeon, Kauvery Hospital, Trichy, Tamil Nadu

<sup>2</sup>Group Clinical Pharmacist, Kauvery Hospital, Trichy, Tamil Nadu

<sup>3</sup>Head of Department & Senior Consultant Orthopaedician, Kauvery Hospital, Trichy, Tamil Nadu

\*Correspondence

## Abstract

### Background

Total knee replacement (TKR) is a well-established surgical intervention for patients with advanced knee arthritis. While clinical, radiological outcomes and patient symptoms are routinely assessed during their visits. Patient-reported outcome measures (PROMs) are less commonly assessed. The PROMs will provide valuable insights into postoperative functional status and quality of life. The Oxford Knee Score (OKS) is one such validated PROM tool for patients who have undergone knee replacements.

### Objective

To evaluate patient-reported functional outcomes following total knee replacement using the Oxford Knee Score among patients who had undergone TKR surgery.

### Methods

This observational cohort study included patients diagnosed with knee arthritis who underwent unilateral or bilateral total knee replacement between January 2022 and December 2024. Oxford Knee Scores were collected through structured telephonic interviews conducted by an independent assessor who is not involved in the care of the patients. Appropriate informed consent was obtained. Orthopedic Surgeons and doctors involved in the care of the patients were not involved in the collection of the data to rule out bias. Standard data such as demographic characteristics, year of surgery, and laterality of surgery were recorded. Outcomes were analyzed descriptively using Oxford Knee Score categories.

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## Results

A total of 90 patients (116 knees) underwent total knee replacement during the study period (2022 to 2024). **Four** patients died during follow-up unrelated to the surgery, one patient developed postoperative infection, **four** were lost to follow-up, and one declined participation even though doing well after the surgery due to an untoward reason. Hence, these 10 patients were excluded from the data collection and analysis for the purpose of the study. **80** patients (103 knees) completed follow-up and were included in the final analysis. The mean age was **63.2** years (range: 30–82 years), with a female predominance (**80%**). Unilateral TKR was performed in 57 patients, while 23 patients underwent bilateral procedures. Based on the Oxford Knee Score, **85%** of patients achieved treatment success, while 15% required further evaluation. According to the Kalairajah grading system, outcomes were excellent in **42.5%**, good in **38.5%**, fair in **13.8%**, and poor in **5%** of patients.

**Keywords:** TKR; Kalairajah grading system; Quality of life; OKS; Joint Register

## 1. Introduction

Osteoarthritis is the second most common rheumatologic problem and it is the most frequent joint disease with a prevalence of 22–39% in India [1]. Many non-surgical therapeutic interventions are available to people with chronic knee pain, such as pharmacological, lifestyle modification and physiotherapy, yet clinical evidence consistently shows that these treatments generally offer only **modest, short-term benefits**. The only intervention that has a large effect size on relieving chronic knee pain is total knee replacement (TKR) [2].

Quality of life (QOL) assessment is increasingly incorporated into clinical research. In medical literature, QOL is becoming an important outcome measure. The QOL can be assessed using patient-reported outcome measures (PROMs). It was increasingly integrated into clinical practice because they are the standardized measures to capture and translate the patient's perspective into objective numerical data. These PROM results provide valuable information to guide and improve the quality of patient care [3]. The aim of this study is to provide the unbiased patient-reported outcome from the patients who have undergone knee arthroplasty at Kauvery Hospital.

## 2. Materials and Methods

### 2.1. Study Design and Setting

This was a multicenter, retrospective follow-up observational study conducted in two tertiary care hospitals. The study included consecutive patients who underwent Total Knee Replacement (TKR) surgery between **January 2022 and December 2024**.

### 2.2. Study Population

Patient details were retrieved from hospital electronic medical records (HMS). Follow-up data were collected by a trained clinical pharmacist under the approval and guidance of an orthopaedic consultant. Patients were selected as a consecutive cohort of the institution to ensure uniformity and minimize bias.

### 2.3. Follow-up and Outcome Assessment

Post-operative outcomes were assessed using the Oxford Knee Score (OKS), a validated patient-reported outcome measure. Follow-up was conducted through structured telephonic interviews using a standardized questionnaire format. All interviews were performed by the same trained clinical pharmacist to maintain consistency.

### 2.4. Ethical Considerations

The study was conducted after obtaining institutional approval. Verbal informed consent was obtained from all participants prior to telephonic follow-up. Patient confidentiality was strictly maintained throughout the study.

### 2.5. Inclusion Criteria

- Patients who underwent Total Knee Replacement surgery between 2022 and 2024
- Patients from both participating centers
- Patients of all age groups
- Patients reachable through telephonic contact
- Patients who provided consent to participate

### 2.6. Exclusion Criteria

- Patients were lost to follow-up or could not be contacted after repeated telephonic attempts.

### 2.7. Limitations of the Study

- Objective clinical parameters (radiological findings, physical examination) were not evaluated.
- Pre-op scores were not collected and analyzed.

## 3. Outcome Measures

The primary outcome of the study was patient satisfaction based on the Kalairajah Grading system for postoperative knee function and treatment success using the Oxford Knee Score (OKS). The OKS is a validated, patient-reported outcome measure consisting of 12 questions evaluating pain and functional ability following total knee replacement, with scores ranging from 0 to 48, where higher scores indicate better outcomes [\[4\]](#).

The secondary outcome measures, postoperative complications like infection and re-surgery during the follow-up period, were recorded to evaluate overall surgical success and durability of outcomes. Both outcome measures were collected through structured telephonic interviews.

Mortality captured during the study period was recorded from the patient's attenders. All the available clinical documents were verified for categorizing the surgical related and non-surgical related mortalities. In the absence of verifiable clinical documents, no assumptions regarding surgical causality were made [\[5\]](#).

### Statistical Analysis

Statistical analysis was performed using SPSS (Version 26.0). The Chi-square test and Fisher’s exact test will be used to find out the association between the categorical variables.  $P < 0.05$  will be considered as statistically significant.

## 4. Results

### 4. 1. Demographics

**Table 1: Demographic details of the study population**

Variables	Mean ± SD (N=80)
Age	63.26 ± 9.862
Gender (Women:Men)	60:20
Side operated (Unilateral:Bilateral)	57:23

Based on age distribution, the highest proportion of patients belonged to the 61–70 years’ age group (37.5%), followed by 51–60 years (32.5%) and 71–80 years (21.3%).

### 4.2. Primary Outcome

#### Kalairajah Grading System (OKS Based)

**Table 2: Scores based on the Kalairajah Grading System**

Kalairajah Grading	Frequency	Percentage
Poor (< 27)	4	5.0
Fair (27–33)	11	13.8
Good (34–41)	31	38.8
Excellent (42–48)	34	42.5

Kalairajah grading Vs Year									
Kalairajah Grading	Year						Total	%	P - Value
	2022	%	2023	%	2024	%			
Poor	1	4.2	1	3.3	2	7.7	4	5.0%	$\chi^2 = 0.050$ Sig.
Fair	3	12.5	1	3.3	7	26.9	11	13.8%	
Good	10	41.7	10	33.3	11	42.3	31	38.8%	
Excellent	10	41.7	18	60.0	6	23.1	34	42.5%	
<b>Overall</b>	<b>24</b>		<b>30</b>		<b>26</b>		<b>80</b>		

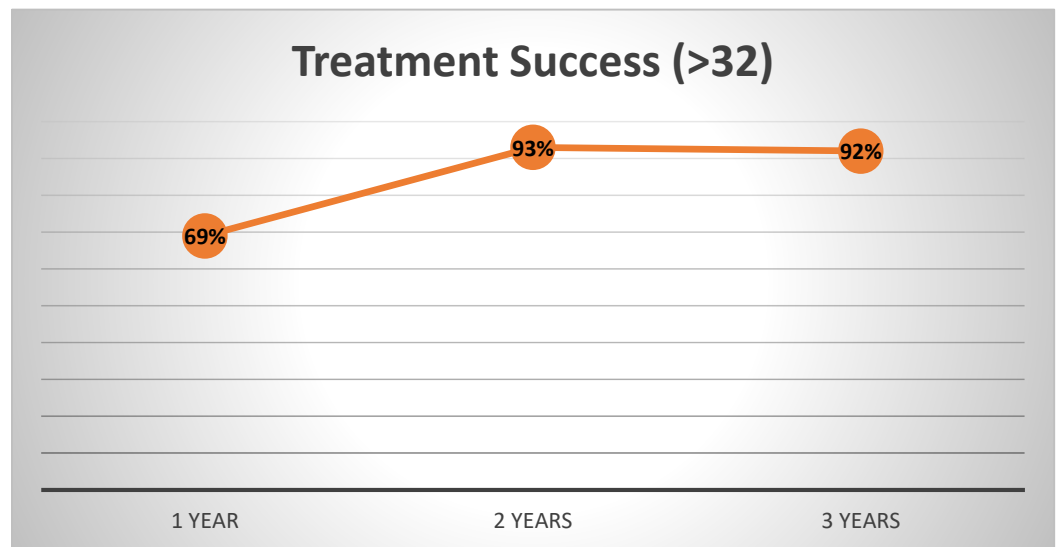
According to the Kalairajah grading system, 42.5% of patients achieved excellent outcomes and 38.5% achieved good outcomes. Fair results were observed in 13.8% of pa-

tients, while poor outcomes were noted in 5% of patients. Our results showed a statistically significant improvement over time, with three-year follow-up patients showing better outcomes compared to one-year follow-up patients.

### 4.3. Patient Satisfaction

**Table 4: Patient satisfaction based on OKS (>32)**

OKS based	Frequency	Percentage
Need to Evaluate	12	15
Treatment Success	68	85
Total	80	100



**Fig (1):** Graphical representation of treatment success based on the OKS outcome

Based on OKS outcomes, treatment success was observed in 85% of patients, while 15% required further evaluation due to suboptimal scores [\[6\]](#).

### 4. 4. Secondary Outcome

Secondary outcomes included mortality, postoperative infection, re-surgery, and untoward reasons affecting participation. Four patients (4.4%) died during the follow-up period all deaths were unrelated to the surgery, verified with the available clinical data. In the absence of clinical evidence, the patient attender’s comments were taken into records. One patient (1.1%) developed a postoperative infection. 1 (1.1%) re surgery due to instability was reported. One patient did not participate in the outcome assessment due to an untoward personal reason. We don’t have any patients with thrombosis and mechanical complications.

### 5. Discussion

- Deep infection rate has been 1.1%. Published infection rates are typically 0.5 to 2%. Our incidence of infection rate was lesser than *Bagheri A et al (2025)*. However, we aim to reduce this to zero by implementing a strict regime of infection control zero in on “zero” infection rate [\[7\]](#).

- 4.4% patient were lost to follow-up but we are tracing these patients to have complete data for all our patients. We have introduced Joint Register 2025 with a resource person for all patients with knee arthritis and joint replacements.
- Treatment success according to OKS has been 85% (72 to 96%). Good to excellent results according to OKS have been 81.3% (64 to 94%). We are in the process of evaluating the 15% patients who are unhappy with the results.
- With the introduction of Robotic knee replacements, resource support person for patients who undergo knee replacement, and improvement in the technique of surgery, we aim to improve satisfaction to 100% [\[8\]](#)
- Drawback of the study, OKS has its own problems and pitfalls. Like certain questions reported in literature, could you able to kneel down and get up? Which eventually reduces the outcome score, which will be corrected in the future by taking the following measures. [\[9\]](#)
- Comparison of pre-op knee score with post-op knee score would reflect more appropriately the treatment success rather than an isolated post-operative knee score. Since we are collecting pre-op OKS to show MCID for 2025 TKRs and Forgotten joint score as part of an ongoing study. We have introduced EQ 5D and EQ 5D VAS for all our knee replacements.

### Conclusion

This study showed that patients undergoing TKR from 2022 to 2024 experienced meaningful improvements in pain, mobility, and daily function as reflected by the Oxford Knee Score. The results showed patient satisfaction consistent with the published literature. There is a trend of significant improvement in PROMs over time, with three-year follow-up patients showing better outcomes compared to one-year follow-up patients.

The use of PROMs proved valuable in capturing patients' recovery progress. The results also highlight the importance of consistent post-operative follow-up, patient education and structured assessment using PROM tools.

Introduction of alternate alignment strategies and improvement of surgical techniques have been implemented and an ongoing study is in place to assess if the satisfaction could be further improved. Our goal is to reach 100 percent satisfaction for our patients who undergo total knee replacements.

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**Conflict of Interest:** We declare no conflict of interest related to our study.

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