Overview Of Post-Operative Clinical Functional Results Of Patients Undergoing Total Knee Replacement Procedures At Royal Prima Hospital

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Abstract.

Total Knee Replacement (TKR) is a surgical procedure aimed at replacing damaged knee joints due to osteoarthritis or other conditions causing pain and dysfunction. This study aims to describe the clinical functional outcomes after TKR based on age and gender among patients at Royal Prima General Hospital, Medan. A descriptive cross-sectional design was used, involving 30 patients who underwent TKR between May and April 2025. Data were collected from medical records and assessed using the Oxford Knee Score (OKS). Statistical analysis was performed to evaluate the distribution of functional outcomes. The results showed that most patients were aged 71–82 years (53.5%) and female (76.7%). Younger patients (56–60 years) achieved better clinical function (Excellent category), while older patients (71–82 years) tended to have Moderate scores. Females demonstrated better clinical outcomes than males. The study concludes that age and gender influence post-TKR clinical function, with younger and female patients showing superior outcomes.

Keywords: *Age; Clinical Function; Gender; Oxford Knee Score and Total Knee Replacement.*

I. INTRODUCTION

Knee osteoarthritis is a leading cause of disability in the elderly population worldwide, with incidence increasing with age and increasing life expectancy (Abidin et al., 2018; Vitamara et al., 2023). Total knee replacement (TKR) is the procedure of choice for treating severe pain and knee joint dysfunction unresponsive to conservative therapy and has been shown to be effective in improving patients' quality of life (Fadlina et al., 2022; Surakarta et al., 2023). In Indonesia, although TKR is increasingly performed, epidemiological data on the number and quality of this procedure are still very limited (Saputra, 2021; Rachman, 2018).The main problem faced after TKR surgery is the variation in clinical functional outcomes between patients, which is influenced by various factors such as age, gender, and comorbidities (Vitamara et al., 2023; Abidin et al., 2018). Several studies have reported that older patients tend to experience decreased muscle strength, functional capacity, and proprioception, thus increasing their risk of mobility impairment and falls (Vitamara et al., 2023; Fadlina et al., 2022). Furthermore, there is a tendency for women to undergo TKR more often than men, but postoperative clinical functional outcomes between the two sexes are still debated (Surakarta et al., 2023; Abidin et al., 2018).

Limited national data and a lack of local research on clinical functional outcomes after TKR in Indonesia, particularly at Royal Prima Hospital Medan, pose challenges in improving the quality of orthopedic services (Saputra, 2021; Rachman, 2018). Previous studies have focused primarily on populations in developed countries, so their results may not be generalizable to the Indonesian population, which has different demographic and socioeconomic characteristics (Abidin et al., 2018; Vitamara et al., 2023).This study aims to describe the clinical functional outcomes after TKR surgery based on patient age and gender at Royal Prima Hospital Medan. The importance of this study lies in its contribution to providing local data that can be used as a basis for clinical decision-making and orthopedic service policy development in Indonesia. The novelty of this study is the comparative analysis of clinical functional outcomes after TKR based on age and gender in the Indonesian patient population, a previously limited study (Fadlina et al., 2022; Surakarta et al., 2023).

II. METHODS

Types and Methods of Research

This study used a descriptive observational approach with a cross-sectional design, which aims to describe the clinical functional outcomes after Total Knee Replacement (TKR) surgery in patients at Royal Prima General Hospital, Medan. The cross-sectional design was chosen because it allows researchers to observe and measure variables simultaneously, thus obtaining a more accurate picture of the patient's clinical condition (Sugiyono, 2022; Cresswell & Creswell, 2023; Fitriani, 2025).

Data Analysis Instruments and Techniques

Research data were collected using patient medical records and the Oxford Knee Score (OKS) questionnaire, which has been proven valid and reliable for assessing postoperative knee clinical function (Fadlina et al., 2022; Surakarta et al., 2023). Data were statistically analyzed using SPSS software. The data were tested for normality and presented in a frequency distribution table, providing a systematic overview of the patient's clinical function outcomes (Sudaryono, 2021; Emzir, 2022; Mukhlashin, 2025).

Population and Sample

The population in this study was all patients who underwent TKR surgery at Royal Prima General Hospital, Medan, during the period 2024–2025. The study sample was taken using a total sampling technique, meaning all population members who met the inclusion and exclusion criteria were eligible to be included in the study sample. Inclusion criteria included all patients undergoing TKR surgery at Royal Prima General Hospital, while exclusion criteria included patients with incomplete medical records (Sugiyono, 2022; Suharyono, 2021; Mukhlashin, 2025).

Research Procedures

The research procedure began with a request for a research permit from the Director of Royal Prima General Hospital. After obtaining permission, the researcher collected secondary data from patient medical records and conducted clinical function assessments using the OKS questionnaire. All collected data were then processed and statistically analyzed to obtain an overview of post-TKR clinical function outcomes based on patient age and gender. This process was carried out systematically and in accordance with quantitative research principles (Sugiyono, 2022; Cresswell & Creswell, 2023; Fitriani, 2025).

III. RESULTS AND DISCUSSIONS

Research result

In a study conducted at Royal Prima Hospital Medan in the period May-April 2025, the characteristics of respondents in the form of age and gender of respondents are presented in the table below.

Table 1. Age of Respondents Total Knee Replacement

Age	Frequency	Percentage
56-60 years old	2	6.6%
61-70 years old	12	39.9%
71-82 years old	16	5 53.5%
Total	**30**	**100%**

The table above shows that the most patients undergoing total knee replacement procedures were aged 70-82 (16 people) (53.5%), 12 (39.9%) in the 60-70 age range, and the fewest (2 people) in the 56-60 age range (6.6%).

Table 2. Gender of Respondents Total Knee Replacement

Gender	Frequency	Percentage
Man	7	23%
Woman	23	76.6%
Total	**30**	**100%**

From the table above, the number of patients who underwent the Total Knee Replacement procedure was 7 (23%) male and 23 (76.7%) female.

Table 3. Results of the Oxford Knee Score Based on Age

Age	Oxford Knee Score Grading		
	Moderate	Good	Excellent
56-60	-	-	2
61-70	-	3	6
71-82	9	10	-
Total	9	13	8

The table above shows the Oxford Knee Score values for patients undergoing Total Knee Replacement procedures, namely those aged 56-60 years with a score of Moderate (-), Good (-), and Excellent (2). Those aged 61-70 years with a score of Moderate (-), Good (3), and Excellent (6). And for those aged 71-82 years, the scores were Moderate (9), Good (10), and Excellent (-).

Table 5. Results of the Oxford Knee Score Based on Gender

Gender	Oxford Knee Score Grading		
	Moderate	Good	Excellent
Man	4	2	1
Woman	5	11	7
Total	9	13	8

The table above shows that the Oxford Knee Score for male patients undergoing Total Knee Replacement is Moderate (4), Good (2), and Excellent (1). For female patients, it is Moderate (5), Good (11), and Excellent (7).

Research Discussion

Using the Oxford Knee Score (OKS), this study examines the clinical functional outcomes of post-total knee replacement (TKR) patients based on age and gender. To explain the findings, researchers will compare them with previous literature and research.

Age Characteristics of Total Knee Replacement Patients

Based on the results of this study, it can be concluded that the majority of patients undergoing TKR procedures were aged 71–82 years, with a proportion of 53.5%. This finding indicates that increasing age, accompanied by the onset of degenerative knee joint disorders due to osteoarthritis, also increases the need for TKR procedures, especially in the elderly.

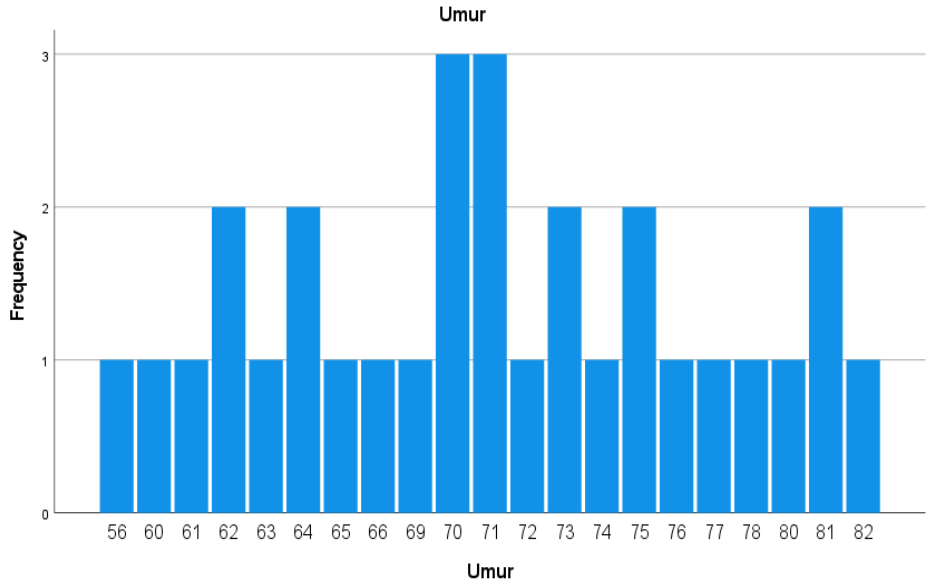

Fig 1. Patient Age Characteristics

This finding is in accordance with the research results(Chen, Feng, and Zhen 2022)in the Journal of Orthopaedic Surgery and Research. The study showed that total knee replacements are most common in people over 70. The primary cause is severe osteoarthritis that cannot be managed with conservative therapy. Increasing age is associated with decreased joint quality, reduced synovial fluid, and increased joint deformity.

Gender Characteristics of Total Knee Replacement Patients

When analyzed by gender, the majority of patients undergoing TKR procedures were women, at 76.7%, compared to only 23.3% of men. This finding is consistent with various studies showing that women are more likely to develop knee osteoarthritis than men. Hormonal factors, particularly the decline in postmenopausal estrogen levels, as well as biomechanical and lifestyle differences are believed to contribute.

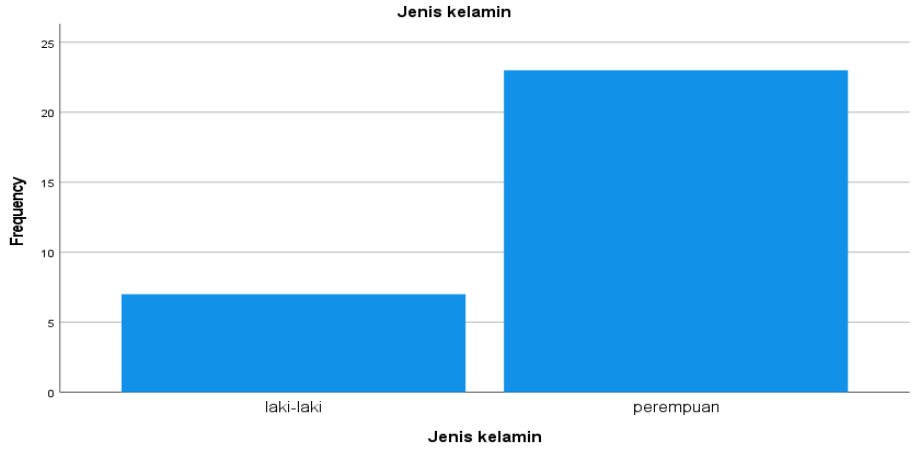

Fig 2. Patient Gender Characteristics

These results are in accordance with research conducted by(Lungu et al. 2016)A study published in the journal Clinical Orthopaedics and Related Research showed that women are more susceptible to knee osteoarthritis and undergo TKR surgery more frequently. This is due to various factors, such as hormonal changes (e.g., decreased estrogen levels after menopause), different knee joint structures, and women's greater sensitivity to pain than men.

Oxford Knee Score Results Based on Age

Research shows that the Oxford Knee Score (OKS) tends to decrease with age. In the 56-60 age group, all patients scored Excellent. In the 61-70 age group, most patients scored Good or Excellent. Meanwhile, in the 71-82 age group, the majority of patients scored Moderate or Good.These results suggest that the younger the patient, the better the functional outcome of the knee after surgery. This is because younger patients typically have better tissue healing, higher activity levels, and a lower risk of complications than older patients. Older patients tend to have underlying medical conditions, limited mobility, and slower tissue regeneration, all of which can impact the outcome of a TKR procedure.This finding is in accordance with research published by(Singh, Kallan, and Katz 2020), which explains that older age is a risk factor for decreased functional outcomes after TKR surgery. This is also supported by research(Clement et al. 2020)which states that age is an important factor in functional outcomes after TKR. In this study, younger patients, those under 70 years of age, typically had better OKS scores one year after surgery than older patients. This may be because younger patients have better tissue regeneration capacity, higher activity levels, and a lower risk of other diseases compared to older patients.

Oxford Knee Score Results by Gender

Based on gender, women showed better OKS scores than men:

Male: the highest score is Moderate

Women: mostly in the Good and Excellent categories

These findings suggest that, despite a higher number of women undergoing TKR, they tend to have better clinical outcomes. This is due to women's greater desire to improve their quality of life after surgery and their higher adherence to rehabilitation programs. However, the unequal sample size between men and women (females significantly outnumbered men) may have influenced the study's results.This is in accordance with research from the journal(Lungu et al. 2016)And(Singh et al. 2020), which showed that women achieved better functional outcomes and satisfaction after knee replacement surgery than men. Psychosocial factors and the rehabilitation process are believed to influence these outcomes, as women tend to be more active in physical therapy and more focused on their recovery.

IV. CONCLUSION

The conclusion of this study shows that the majority of patients undergoing Total Knee Replacement (TKR) procedures at Royal Prima Hospital Medan are in the elderly age group, specifically 71–82 years old, and are predominantly female. The results of the assessment using the Oxford Knee Score (OKS) indicate that younger and female patients tend to achieve better clinical functional outcomes after surgery. These findings strengthen the evidence that age and gender play an important role in determining functional outcomes after TKR, in line with international literature stating that tissue regeneration ability and adherence to rehabilitation are higher in these groups.

However, this study is limited by its relatively small sample size and unequal distribution between age groups and gender, so generalization of the results should be done with caution. Furthermore, the use of secondary data from medical records may introduce potential information bias. For future research, it is recommended to conduct longitudinal studies involving larger samples and analyze other factors such as comorbidities and physical activity levels. The practical implication of this study is the need for an individualized approach in post-TKR rehabilitation programs, taking into account the patient's age and gender to optimize functional outcomes and quality of life.

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